Motherboards

MXGF Series

ATX Motherboard with 4 PCI and 2 PCIe Slots, VGA, SATA, RAID, USB, LAN and Audio

USER'S MANUAL

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Chapter

1

Introduction

1.1 MXGF Motherboard Overview

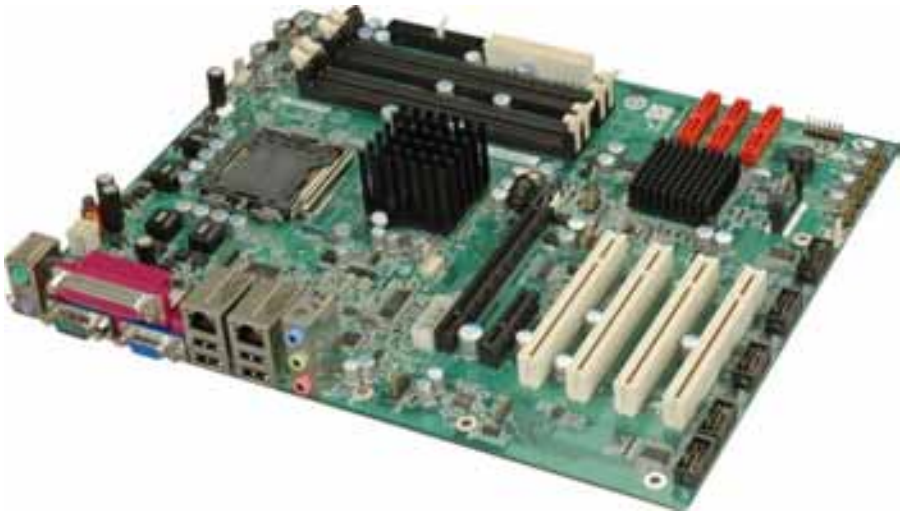

Figure 1–1: MXGF

The MXGF is an ATX form factor industrial PC motherboard. The ATX form factor is a relatively large form factor, providing room for extra features and capabilities including more powerful processors that benefit from the larger dimensions and better cooling of ATX computer cases.

The MXGF supports Intel® Core™2 Quad, Intel® Core™2 Duo, Intel® Pentium®4/D and Intel® Celeron® D processors and supports up to up to 8.0 GB of DDR2 memory with up to 2.0 GB in each memory slot.

Six SATA ports provide advanced storage capabilities with 3.0 MB/s data transfer rates. RAID 0 support allows for increased data throughput for applications requiring quick data access. RAID 1, 5 and 10 provide data redundancy allowing for the failure of one or more disks without losing data.

Graphics capabilities include a VGA port on the rear panel and a PCIe x16 graphics card slot. The graphics card slot supports the latest graphics cards, offering rendering and quality capable of supporting the most intensive graphics applications.

Networking is provided through two GbE controllers. The GbE controllers allow network data speeds of up to 1.0Gb/s, allowing for fast communication between computers on the

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network and with computers on external networks. The first LAN port supports Intel® AMT 5.0 for powerful remote management options.

Expansion capabilities include four PCI slots, one PCIe x4 slot, twelve USB ports, six serial ports and a parallel port.

1.1.1 Benefits

Some of the MXGF motherboard benefits include,

- Operating reliably in harsh industrial environments up to 60°C
- The system is always available and will reboot if the system crashes
- Powerful processor options are ideal for computing intensive applications
- Data is protected through fast and reliable SATA RAID storage

1.1.2 Features

Some of the MXGF motherboard features are listed below:

- ATX form factor
- RoHS compliant
- LGA 775 CPU socket
- PCI and PCIe expansion slots
- Four DDR2 DIMMs up to 2.0 GB each supported
- Two Gigabit Ethernet controllers
- Twelve USB 2.0 ports supported
- HD audio codec for 7.1 channels

1.1.3 Board Dimensions

The dimensions of the board are listed below:

- Length: 305 mm
- Width: 244 mm

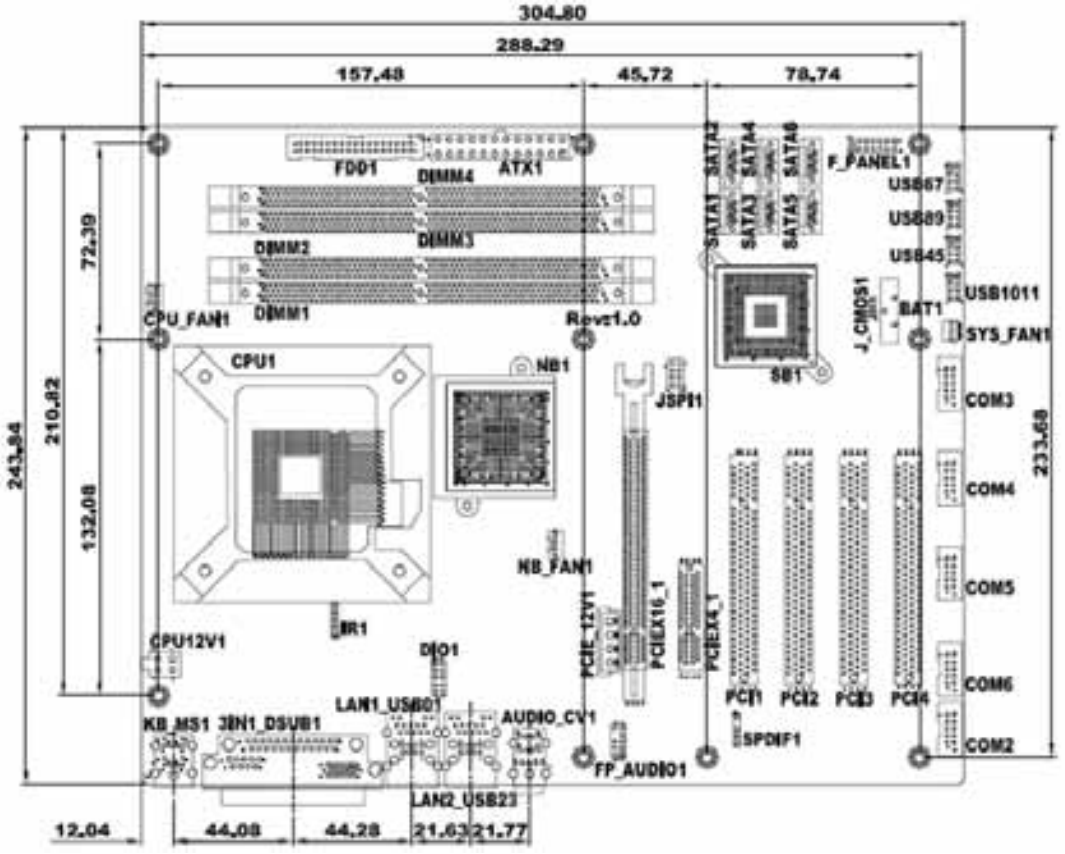

Figure 1-2: MXGF Dimensions (mm)

1.1.4 External Peripheral Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 1-3**.

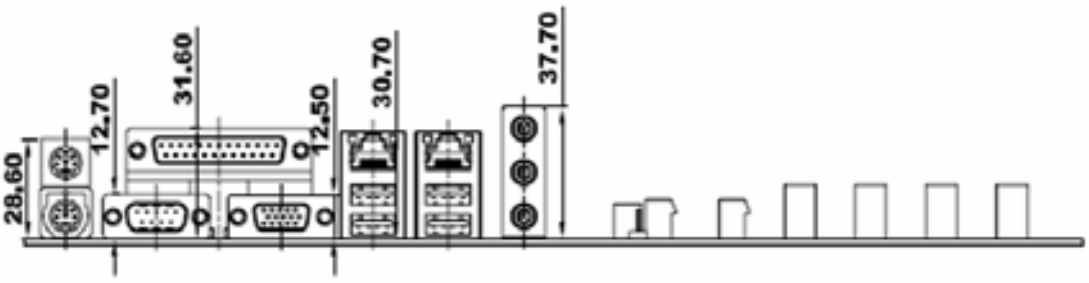

Figure 1-3: External Interface Panel Dimensions (mm)

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1.2 Data Flow

Figure 1-4 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

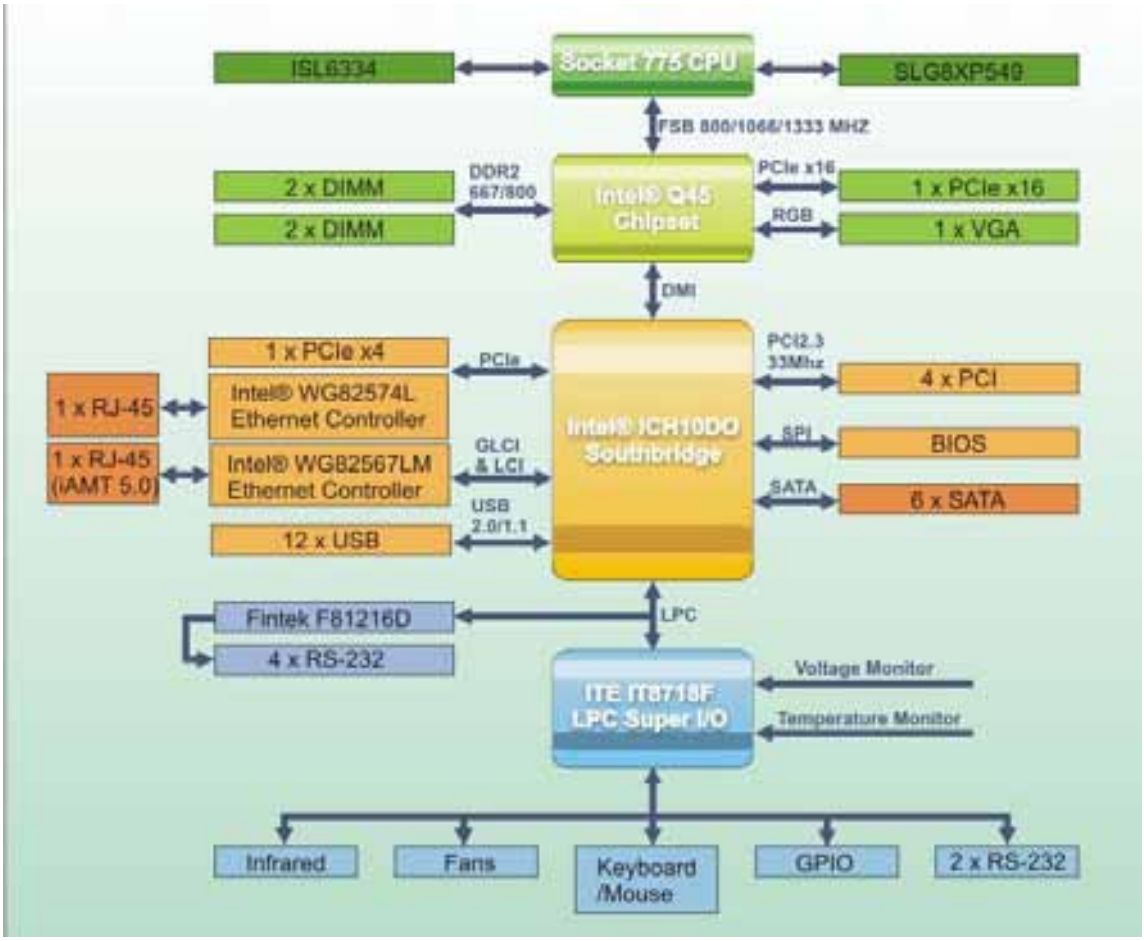

Figure 1-4: Data Flow Block Diagram

1.3 Technical Specifications:

MXGF motherboard technical specifications are listed in the table below.

Specification/Model	MXGF

Specification/Model	MXGF
Form Factor	ATX
CPU Supported	LGA775 Intel® Core™2 Quad (Yorkfield) LGA775 Intel® Core™2 Duo (Wolfdale and Conroe) LGA775 Intel® Pentium® 4/D (Wolfdale and Conroe) LGA775 Intel® Celeron® D (Conroe L)
Front Side Bus (FSB)	800 MHz, 1066 MHz or 1333 MHz
Northbridge Chipset	Intel® Q45
Integrated Graphics	350 MHz Integrated 24-bit RAMDAC Up to 2048 x 1536 32-bit color @ 75 Hz refresh Unified Memory Architecture (UMA) Uses up to 352 MB of Dynamic Video Memory Technology (DVMT)
Memory	Four dual-channel 2.0 GB (max.) 667 MHz or 800 MHz DDR2 SDRAM DIMMs (system max. 8.0 GB) supported
Southbridge Chipset	Intel® ICH10DO
Audio	Realtek ALC888 audio codec
BIOS	AMI BIOS
Digital I/O	8-bit, 4-bit input/4-bit output
Ethernet Controllers	Intel® 82574L (MAC+PHY) through the PCIe x1 Intel® 82567LM (PHY) + Intel® ICH10DO (MAC)
Trusted Platform Module	iTPM v1.2 and above supported
Super I/O Controller	ITE IT8718F
Serial Port Controller	Fintek F81216
Real Time Clock	Motorola MC146818A with 256 bytes of battery-backed RAM, 32.768 KHz crystal, 3 V battery
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Expansion	
PCI	Four PCI slots

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Specification/Model	MXGF
PCIe	One PCIe x4 slot One PCIe x16 slot (PCI Express Graphics interface)
I/O Interface Connectors	
Audio Connectors	One external audio jack (line-in, line-out, mic-in) Two internal audio connectors (front panel pin header and S/PDIF pin header)
Display port	One VGA
Ethernet	One RJ-45 port One RJ-45 port with iAMT 5.0 support
Keyboard/Mouse	One dual PS/2 port
LPT	One IEEE 1284 parallel port (supports normal, EPP and ECP modes)
Serial Ports	One RS-232 port Five via internal RS-232 box pin headers
USB 2.0/1.1 ports	Four external USB ports Eight via internal pin headers
Storage	
Floppy Disk Drives	Two 5.25” 360 KB or 1.2 MB floppy disk drives (FDD) or 3.5” 720 KB, 1.44 MB, 2.88 MB FDD.
Serial ATA	Six independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates
Environmental and Power Specifications	
Power Supply	ATX supported

Specification/Model	MXGF
Power Consumption	3.3 V @ 2.64A 5 V @ 5.40A 12 V @ 0.28A 3.16 GHz E8500 Intel® Core™2 Duo CPU with 1333 MHz FSB and 2.0 GB of 800 MHz DDR2 memory running 3DMark 2001SE
Operating temperature	0ºC ~ 60ºC (requires cooler and silicone heat sink paste)
Humidity	0% ~ 95% (non-condensing)
Physical Specifications	
Dimensions	305mm x 244mm
Weight GW/NW	1200g/600g

Table 1-1: MXGF Specifications

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Chapter

2

Unpacking

2.1 Anti-static Precautions

WARNING!

Failure to take ESD precautions during the installation of the MXGF may result in permanent damage to the MXGF and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MXGF. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the MXGF, or any other electrical component, is handled.

- ***Wear an anti-static wristband*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding*** - Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad*** - When configuring the MXGF, place it on an antic-static pad. This reduces the possibility of ESD damaging the MXGF.
- ***Only handle the edges of the PCB*** - When handling the PCB, hold the PCB by the edges.

2.2 Unpacking

When the MXGF is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the MXGF does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

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2.3 Unpacking Checklist

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact a CyberResearch sales representative directly by sending an email to sales@cyberresearch.com.

2.3.1 Package Contents

The MXGF is shipped with the following components:

Quantity	Item and Part Number	Image
1	MXGF	
2	Dual RS-232 cable (with bracket)	
6	SATA cable	
1	I/O Shielding	
1	Mini jumper pack (2.0 mm)	
1	Utility CD	

Quantity	Item and Part Number	Image

Table 2-1: Packing List

2.3.2 Optional Items

The MXGF is shipped with the following components:

Item and Part Number	Image
CPU cooler	
CPU cooler	
FDD cable	
SATA power cable	
PCIe 16X SDVO interface DVI graphic card	
PCIe 16X SDVO interface VGA graphic card	

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Item and Part Number	Image
USB cable 4-port with bracket	
USB cable, Dual port with bracket	

Table 2-2: Optional Items

Chapter

3

Connector Pinouts

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3.1 Peripheral Interface Connectors

Section 3.1.2 shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.2**.

3.1.1 MXGF Layout

Figure 3-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

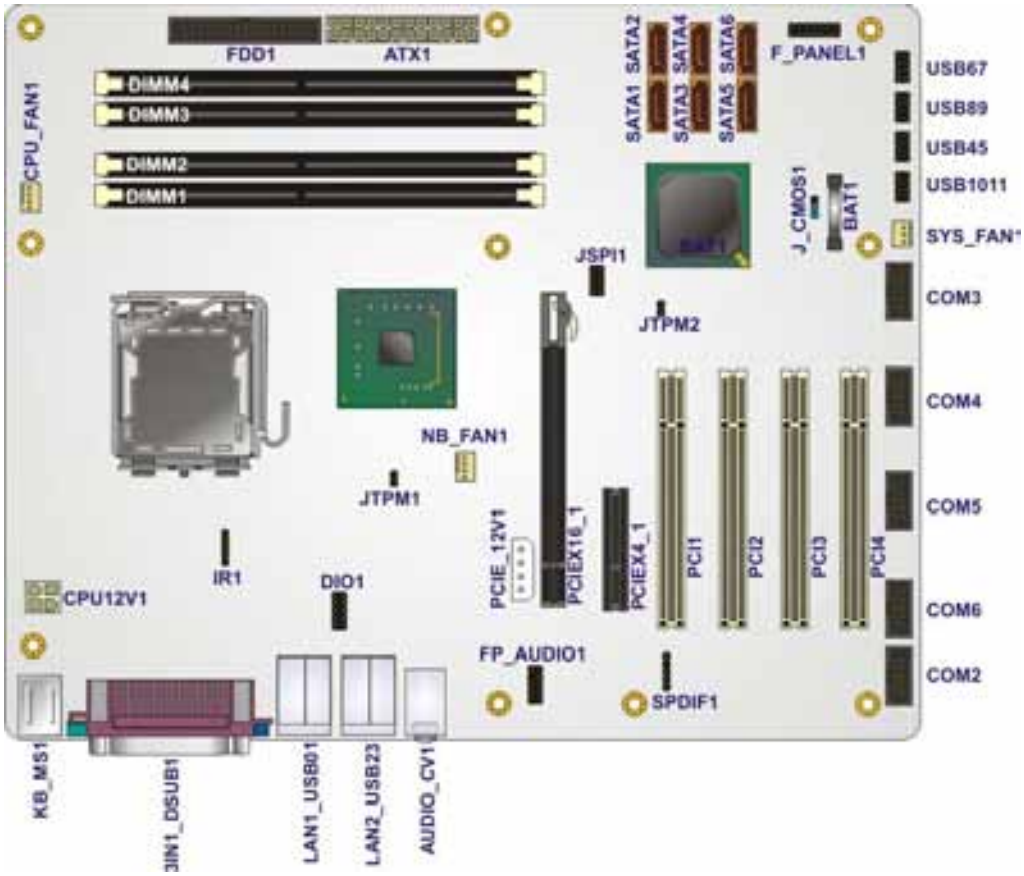

Figure 3-1: Connector and Jumper Locations

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the MXGF. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector, CPU	4-pin ATX	CPU12V1
ATX power connector, system	24-pin ATX	ATX1
Audio connector	10-pin header	FP_AUDIO1
Digital I/O connector	10-pin header	DIO1
Fan connector, System	3-pin wafer	SYS_FAN1
Fan connectors, CPU and Northbridge	4-pin wafer	CPU_FAN1 NB_FAN1
Floppy disk connector	34-pin box header	FDD1
Front panel connector	14-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
PCI connectors	PCI slot	PCI1 PCI2 PCI3 PCI4
PCIe power connector		PCIE_12V1
PCIe x16 connector	PCIe x16 slot	PCIEX16_1
PCIe x4 connectors	PCIe x4 slot	PCIEX4_1
SATA connector	7-pin SATA	SATA1 SATA2 SATA3 SATA4 SATA5 SATA6

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Connector	Type	Label
Serial port connector	10-pin box header	COM2 COM3 COM4 COM5 COM6
S/PDIF connector	5-pin header	SPDIF1
SPI flash connector	8-pin header	JSPI1
USB connector	10-pin header	USB45 USB67 USB89 USB1011

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

Table 3-2 lists the rear panel connectors on the MXGF. Detailed descriptions of these connectors can be found in **Section 3.1**.

Connector	Type	Label
Audio connectors	Audio jacks	AUDIO_CV1
Keyboard and mouse connectors	Dual PS/2	KB_MS1
LAN Connector	RJ-45	LAN1_USB01 LAN2_USB23
Parallel port connector	DB-25 connector	3IN1_DSUB1
RS-232 serial port connector	D-sub 9-pin male	3IN1_DSUB1
USB 2.0 ports	Dual USB ports	LAN1_USB01 LAN2_USB23
VGA port connector	15-pin female VGA	3IN1_DSUB1

Table 3-2: Rear Panel Connectors

3.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the MXGF.

3.2.1 ATX CPU Power Connector

CN Label: **CPU12V1**

CN Type: 4-pin ATX power connector (1x4)

CN Location: See **Figure 3-2**

CN Pinouts: See **Table 3-3**

The 4-pin ATX power connector is connected to an ATX power supply.

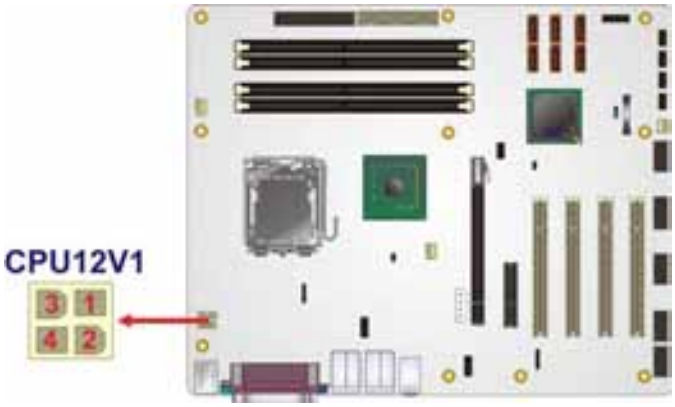

Figure 3-2: ATX Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	GND
3	+12 V
4	+12 V

Table 3-3: ATX Power Connector Pinouts

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3.2.2 ATX Power Connector

CN Label: **ATX1**

CN Type: 24-pin ATX (2x24)

CN Location: See **Figure 3-3**

CN Pinouts: See **Table 3-4**

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

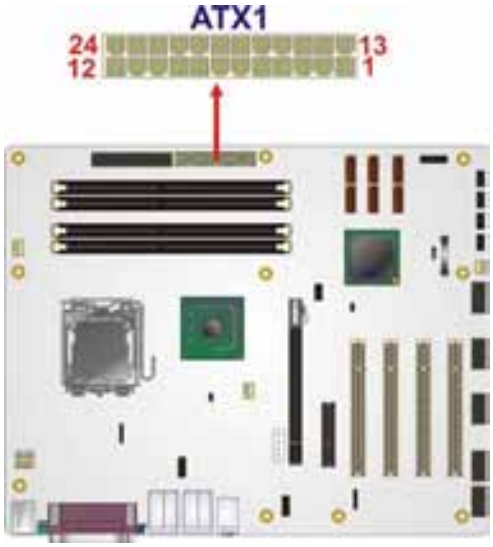

Figure 3-3: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	-12 V
3	GND	15	GND
4	+5 V	16	PS-ON
5	GND	17	GND
6	+5 V	18	GND
7	GND	19	GND
8	NC	20	NC

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	+VCC5SB	21	+5 V
10	+12 V	22	+5 V
11	+12 V	23	+5 V
12	+3.3 V	24	GND

Table 3-4: ATX Power Connector Pinouts

3.2.3 Audio Connector

CN Label: **FP_AUDIO1**

CN Type: 10-pin header

CN Location: See **Figure 3-4**

CN Pinouts: See **Table 3-5**

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

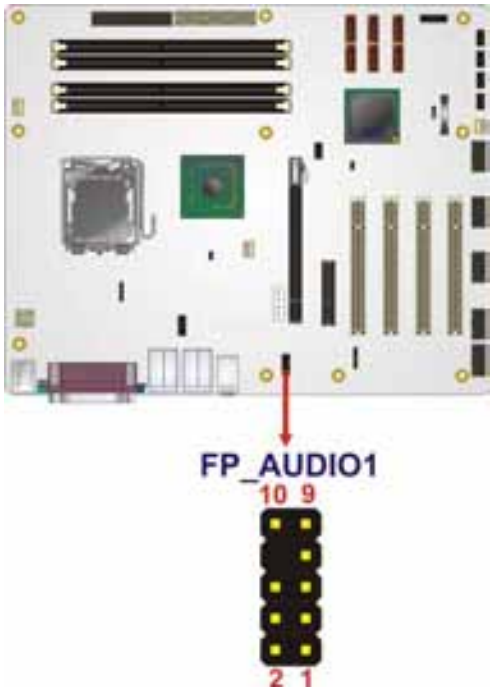

Figure 3-4: Audio Connector Pinouts

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Microphone left	2	GND
3	Microphone right	4	PRESENCE
5	Line out right	6	GND
7	SENSE_SEND	8	N/C
9	Line out left	10	GND

Table 3-5: Audio Connector Pinouts

3.2.4 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The digital input/output connector is managed through a Super I/O chip. The Digital I/O connector pins are user programmable.

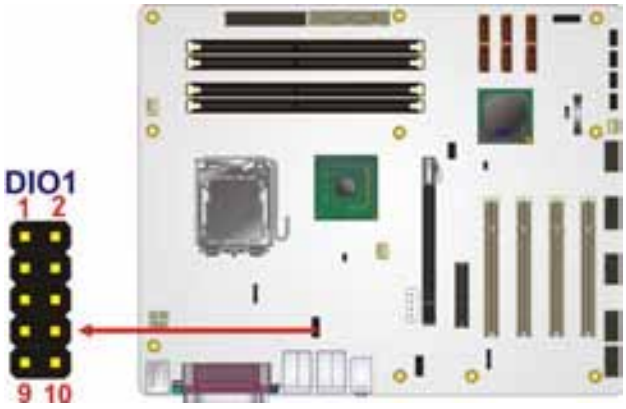

Figure 3-5: Digital I/O Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 3-6: Digital I/O Connector Pinouts

3.2.5 Fan Connectors, CPU and Northbridge

CN Label: **CPU_FAN1, NB_FAN1**

CN Type: 4-pin header

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The cooling fan connector provides a 12 V, 500mA current to a CPU cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

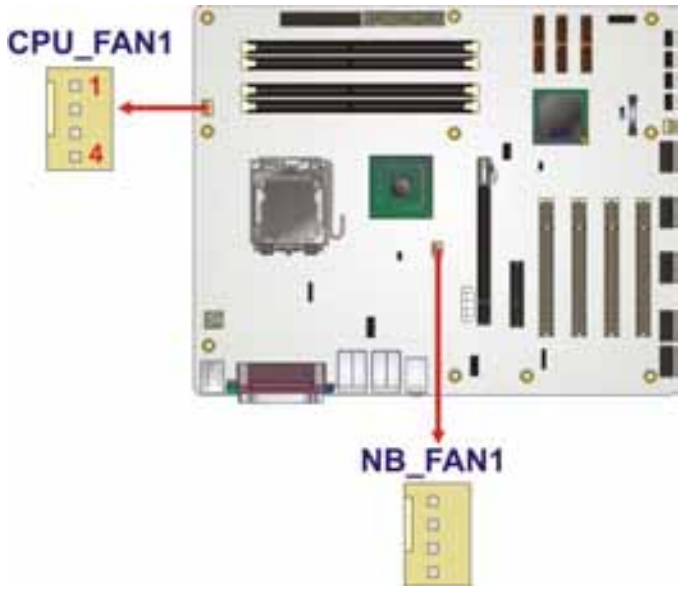

Figure 3-6: CPU and Northbridge Fan Connectors Location

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PIN NO.	DESCRIPTION
1	GND
2	+12 VCC
3	Rotation Signal
4	Control

Table 3-7: CPU Fan Connector Pinouts

3.2.6 Fan Connector, System

CN Label: **SYS_FAN1**

CN Type: 3-pin header

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

The cooling fan connector provides a 12 V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

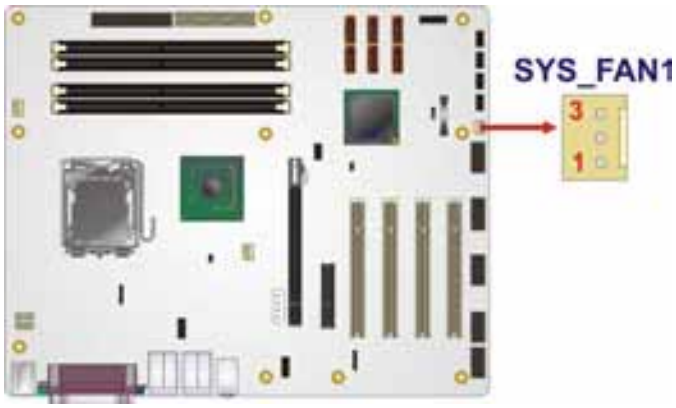

Figure 3-7: System Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12 V

PIN NO.	DESCRIPTION
3	Fan Speed Detect

Table 3-8: System Fan Connector Pinouts

3.2.7 Floppy Disk Connector

CN Label: **FDD1**

CN Type: 34-pin header (2x17)

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

The floppy disk connector is connected to a floppy disk drive. The MXGF supports the following floppy disk drives:

- 360 KB
- 720 KB
- 1.2 MB
- 1.44 MB
- 2.88 MB

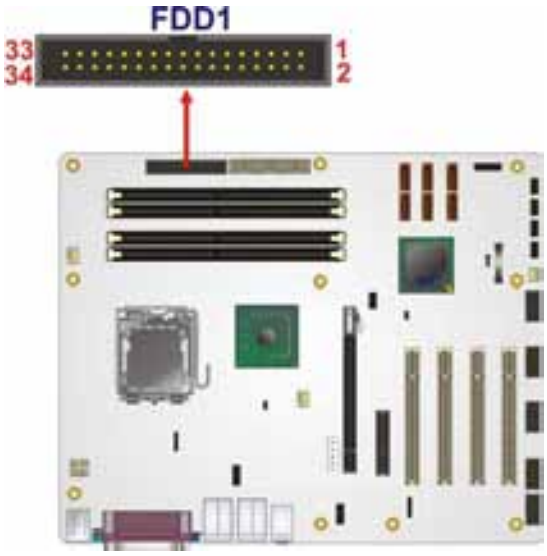

Figure 3-8: 34-pin FDD Connector Location

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 3-9: 34-pin FDD Connector Pinouts

3.2.8 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

The front panel connector connects to external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED

- HDD LED
- Speaker

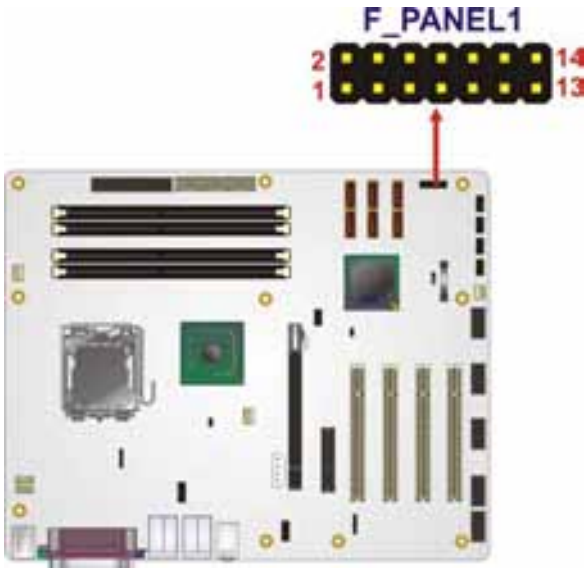

Figure 3-9: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED +5 V	Speaker	2	+5 V
	3	N/C		4	N/C
	5	Ground		6	N/C
Power Button	7	Power Button+		8	Speaker
	9	Power Button-	Reset	10	N/C
HDD LED	11	+5 V		12	RESET-
	13	HDLED-		14	GND

Table 3-10: Front Panel Connector Pinouts

3.2.9 Infrared Interface Connector (5-pin)

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

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The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

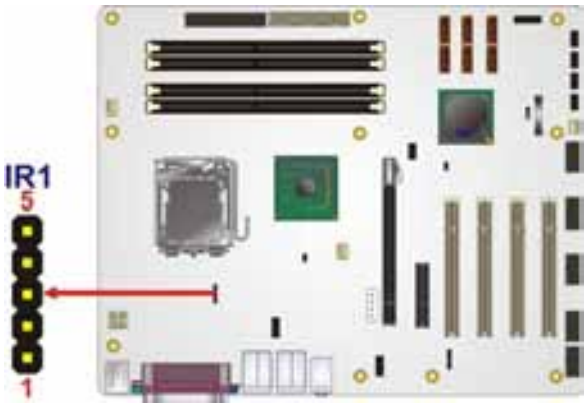

Figure 3-10: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 3-11: Infrared Connector Pinouts

3.2.10 PCI Express x4 Slot

CN Label: **PCIE4X_1**

CN Type: PCIe x4 slots

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

PCIe x4 expansion devices can be inserted into the PCIe x4 slots.

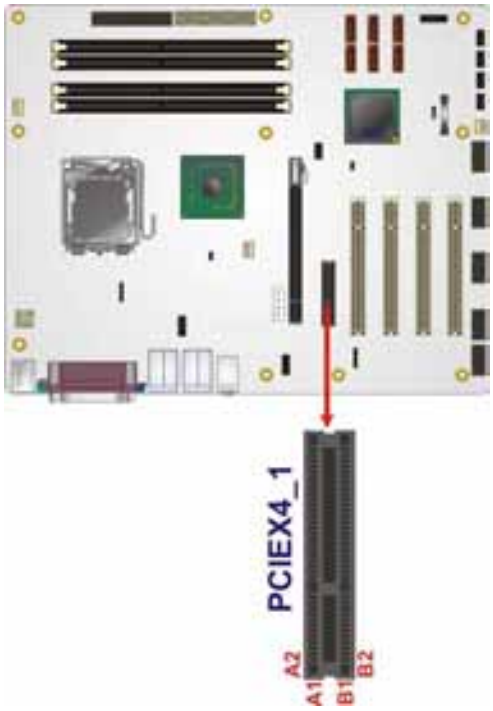

Figure 3-11: PCIe x4 Connector Locations

SIDE A				SIDE B			
PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	N/C	A2	+12 V	B1	+12 V	B2	+12 V
A3	+12 V	A4	GND	B3	+12 V	B4	GND
A5	N/C	A6	N/C	B5	SMCLK	B6	SMDAT
A7	N/C	A8	N/C	B7	GND	B8	+3.3 V
A9	+3.3 V	A10	+3.3 V	B9	N/C	B10	3.3 V
A11	RESET	A12	GND	B11	WAKE#	B12	N/C
A13	REFCLK+	A14	REFCLK-	B13	GND	B14	HSOp(0)
A15	GND	A16	HSIp(0)	B15	HSOn(0)	B16	GND
A17	HSIn(0)	A18	GND	B17	N/C	B18	GND
A19	N/C	A20	GND	B19	HSOp(1)	B20	HSOn(1)
A21	HSIp(1)	A22	HSIn(1)	B21	GND	B22	GND
A23	GND	A24	GND	B23	HSOp(2)	B24	HSOn(2)
A25	HSIp(2)	A26	HSIn(2	B25	GND	B26	GND
A27	GND	A28	GND	B27	HSOp(3)	B28	HSOn(3)

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SIDE A				SIDE B			
A29	HSIp(3)	A30	HSIn(3)	B29	GND	B30	N/C
A31	GND	A32	N/C	B31	N/C	B32	GND

Table 3-12: PCIe x4 Pinouts

3.2.11 PCI Express x16 Slot

CN Label: **PCIEX16_1**

CN Type: PCIe x16 slot

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13** (Side A) **Table 3-14** (Side B)

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.

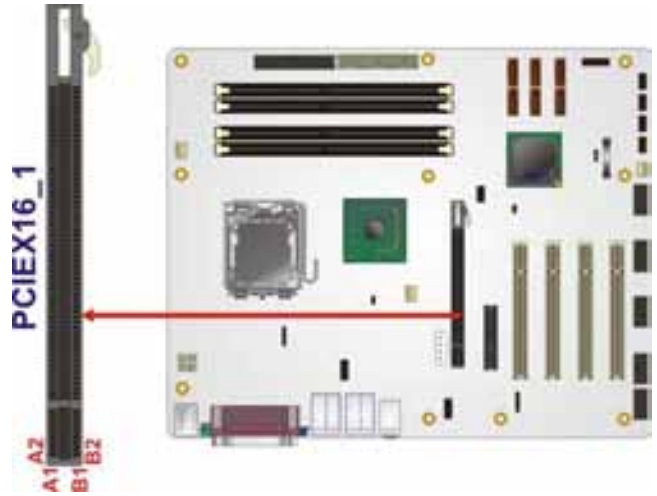

Figure 3-12: PCIe x16 Connector Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		
A21	GND	A42	GND	A63	GND		

Table 3-13: PCIe x16 Side A Pinouts

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3 Vaux	B31	PRSNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)

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PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 3-14: PCIe x16 Side B Pinouts

3.2.12 PCI Slot

CN Label: **PCI1, PCI2, PCI3 and PCI4**

CN Type: PCI Slot

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-15**

The PCI slot enables a PCI expansion module to be connected to the board.

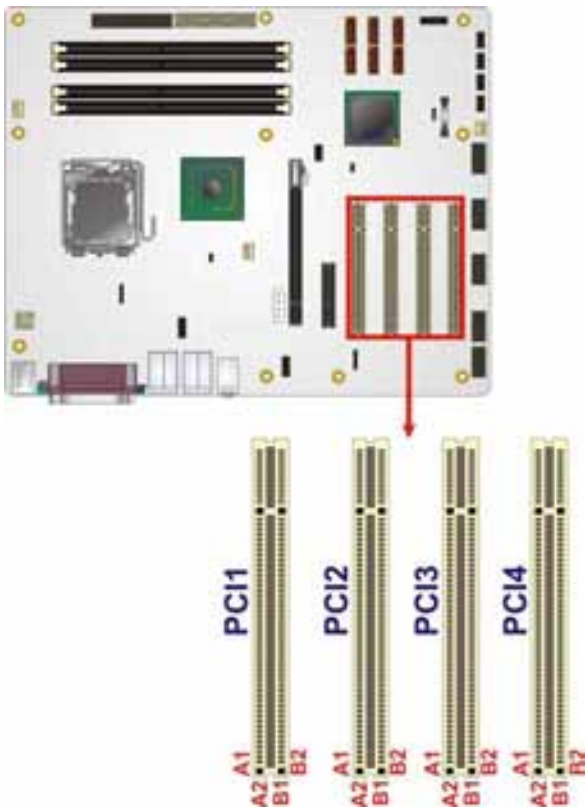

Figure 3-13: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12 V
A2	+12 V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5 V	B5	+5 V
A6	INTA	B6	+5 V
A7	INTC	B7	INTB
A8	+5 V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5 V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A14	3.3 V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5 V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5 V
A20	AD30	B20	AD31
A21	+3.3 V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3 V
A26	IDSEL	B26	C/BE3
A27	+3.3 V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3 V
A32	AD16	B32	AD17
A33	+3.3 V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3 V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3 V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3 V
A42	GND	B42	SERR
A43	PAR	B43	+3.3 V
A44	AD15	B44	C/BE1

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A45	+3.3 V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3 V	B53	AD7
A54	AD6	B54	+3.3 V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5 V	B59	+5 V
A60	REQ64	B60	ACK64
A61	+5 V	B61	+5 V
A62	+5 V	B62	+5 V

Table 3-15: PCI Slot

3.2.13 SATA Drive Connectors

CN Label: **SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6**

CN Type: SATA drive connectors

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-16**

The six SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 300 MB/s. The SATA drives can be configured in a RAID configuration.

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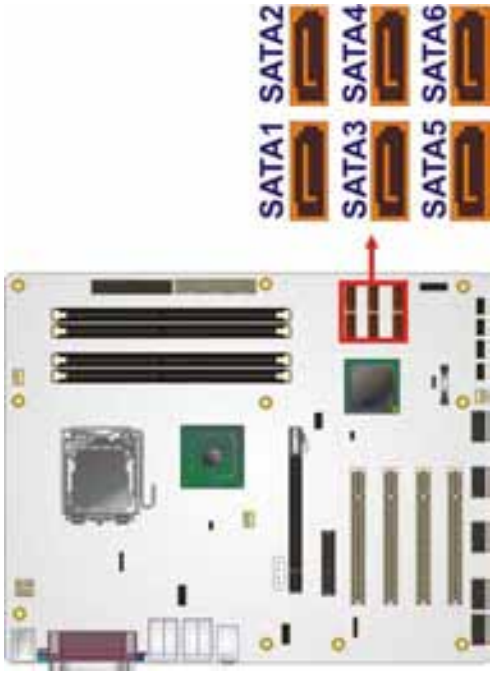

Figure 3-14: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 3-16: SATA Drive Connector Pinouts

3.2.14 S/PDIF Connector

CN Label: **SPDIF1**

CN Type: 5-pin header

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-17**

Use the SPDIF connector to connect digital audio devices to the system.

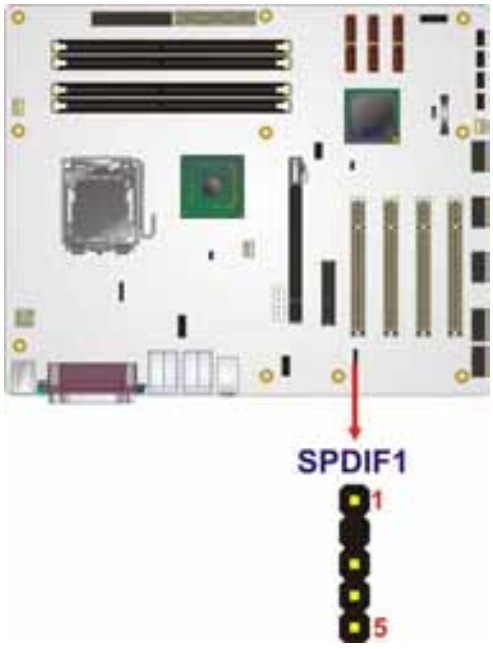

Figure 3-15: SPDIF Connector Pinout Locations

PIN	DESCRIPTION
1	5 V audio
2	NC
3	SPDIF out
4	GND audio
5	SPDIF in

Table 3-17: SPDIF Connector Pinouts

3.2.15 Serial Port Connectors

CN Label: **COM2, COM3, COM4, COM5, COM6**

CN Type: 9-pin box headers (2x5)

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-18**

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The 10-pin serial port connectors provide a RS-232 serial communications channels. The serial port connectors can be connected to external RS-232 serial port devices.

Figure 3-16: Serial Port Connectors Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set to Ready (DSR)
7	Request to Send (RTS)	8	Clear to Sent (CTS)
9	Ring Indicator (RI)	10	N/C

Table 3-18: Serial Port Connector Pinouts

3.2.16 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-17**

CN Pinouts: See **Table 3-19**

The SPI connector is for flashing the SPI BIOS.

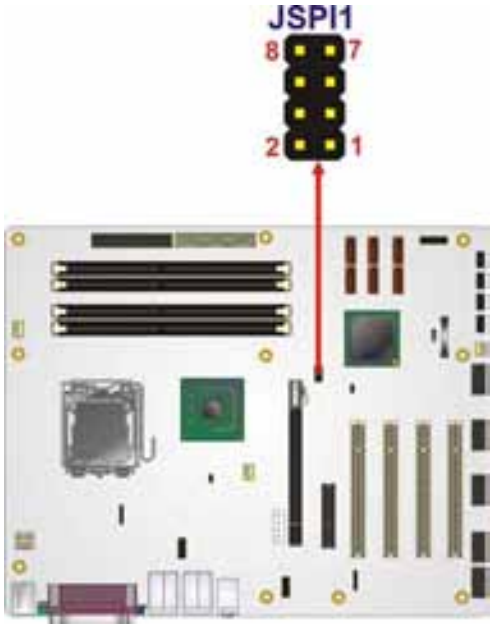

Figure 3-17: SPI Flash Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	NC	8	NC

Table 3-19: SPI Flash Connector

3.2.17 USB Connectors

CN Label: **USB45, USB67, USB89 and USB1011**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-20**

The 2x5 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

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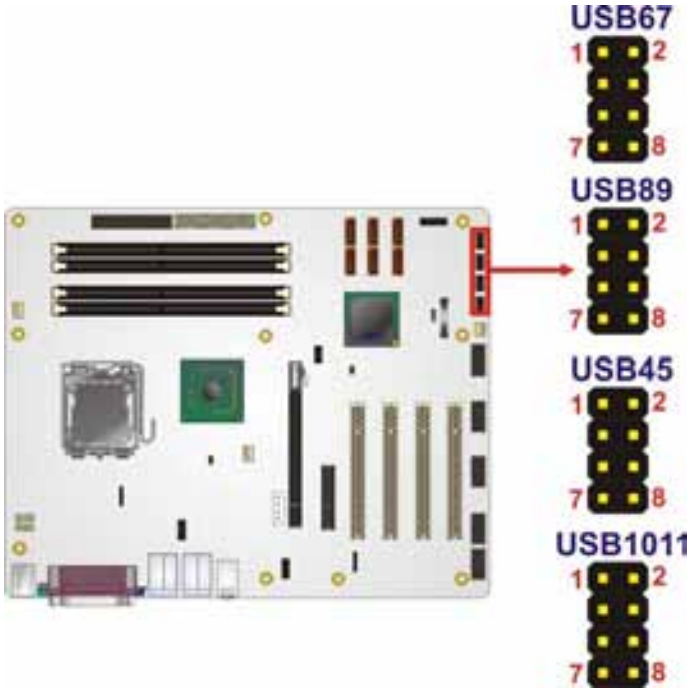

Figure 3-18: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 3-20: USB Port Connector Pinouts

3.3 External Interface Connectors

Figure 3-19 shows the MXGF motherboard external interface connectors. The MXGF on-board external interface connectors are shown in **Figure 3-19**:

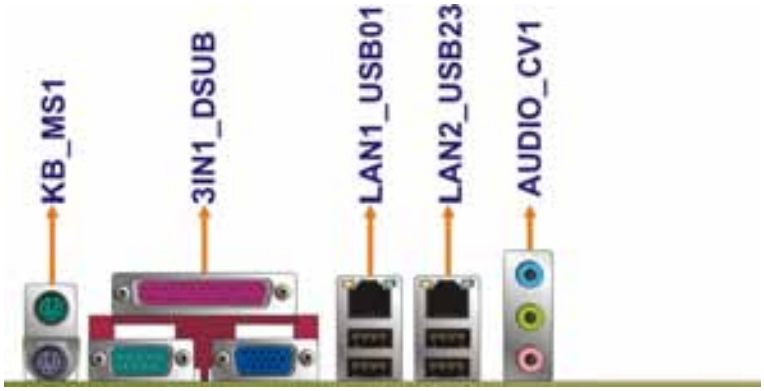

Figure 3-19: MXGF External Interface Connectors

3.3.1 Audio Connector

CN Label: **AUDIO1**

CN Type: 3 x audio jacks

CN Location: See **Figure 3-19**

The three audio jacks on the external audio connector enable the MXGF to be connected to external audio devices as specified below.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to headphones or speakers.
- **Microphone (Pink):** Connects a microphone.

Figure 3-20: Audio Connector

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3.3.2 Ethernet Connector

CN Label: **LAN1_USB01, LAN2_USB23**

CN Type: RJ-45

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-21**

A 10/100/1000 Mb/s connection can be made to a Local Area Network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	5	N/C
2	N/C	6	RX-
3	TX-	7	N/C
4	RX+	8	N/C

Table 3-21: Ethernet Connector Pinouts

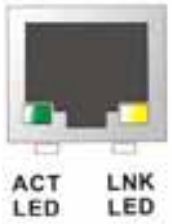

Figure 3-21: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked.

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100 MB OFF: 10 MB	YELLOW	ON: Linked Flashing: Activity

Table 3-22: Connector LEDs

3.3.3 Keyboard and Mouse Connector

CN Label: **KB_MS1**

CN Type: PS/2

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-23** and **Figure 3-22**

The MXGF has two PS/2 connectors on the mounting bracket for easy connection to a PS/2 keyboard and PS/2 mouse.

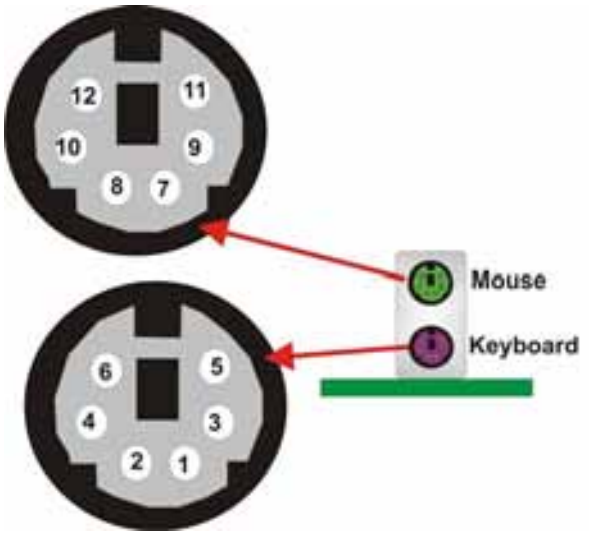

Figure 3-22: PS/2 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	KEYBOARD DATA	7	MOUSE DATA
2	NC	8	NC
3	GND	9	GND
4	+5 V	10	+5 V
5	KEYBOARD CLOCK	11	MOUSE DATA
6	NC	12	NC

Table 3-23: PS/2 Connectors

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3.3.4 Parallel Port Connector

CN Label: **LPT**

CN Type: 26-pin box header

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-24**

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	25	GROUND
13	PRINTER SELECT		

Table 3-24: Parallel Port Connector Pinouts

Figure 3-23: Parallel Port Connector Location

3.3.5 Serial Port Connector

CN Label: **COM1**

CN Type: DB-9 connector

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-25** and **Figure 3-24**

The RS-232 serial connector provides serial connection in the RS-232 mode.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD#	6	DSR#
2	RxD	7	RTS#
3	TxD	8	CTS#
4	DTR#	9	RI#
5	GND		

Table 3-25: Serial Port Pinouts

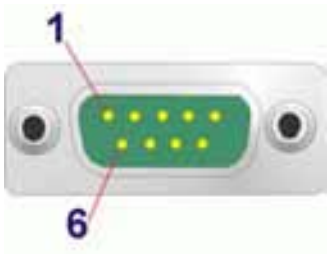

Figure 3-24: Serial Port Pinout Locations

3.3.6 USB Ports

CN Label: **LAN1_USB01 and LAN2_USB23**

CN Type: USB Combo ports

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-26**

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The USB combo port and LAN/USB combo port provides connectivity to five additional USB devices. USB devices connect directly to the USB connectors on the rear panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5 V	5	+5 V
2	D-	6	D-
3	D+	7	D+
4	GND	8	GND

Table 3-26: USB Connector Pinouts

3.3.7 VGA Connector

CN Label: **VGA**

CN Type: D-sub 15-pin female connector

CN Location: See **Figure 3-19**

CN Pinouts: See **Figure 3-25** and **Table 3-27**

The standard 15-pin female VGA connector connects to a CRT or LCD monitor.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	SDA
3	BLUE	8	GROUND	13	HSYNC
4	+5V	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	SCL

Table 3-27: VGA Connector Pinouts

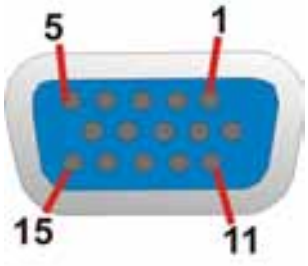

Figure 3-25: VGA Connector

Chapter

4

Installation

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4.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the MXGF may result in permanent damage to MXGF and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the MXGF. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the MXGF, or any other electrical component, is handled.

- ***Wear an anti-static wristband***: - Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***:- Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the MXGF, place it on an antic-static pad. This reduces the possibility of ESD damaging the MXGF.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

4.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the MXGF is installed. All installation notices pertaining to the installation of MXGF should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the MXGF and injury to the person installing the motherboard.

4.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the MXGF, MXGF components and injury to the user.

Before and during the installation please **DO** the following:

- **Read the user manual**:
  - The user manual provides a complete description of the MXGF installation instructions and configuration options.
- **Wear an electrostatic discharge cuff (ESD)**:
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and helps prevent ESD damage.
- **Place the MXGF on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the MXGF off**:
  - When working with the MXGF, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the MXGF **DO NOT:**

- Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- Use the product before verifying all the cables and power connectors are properly connected.
- Allow screws to come in contact with the PCB circuit, connector pins, or its components.

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4.3 CPU, CPU Cooling Kit and DIMM Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU, MXGF and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the MXGF. If one of these component is not installed the MXGF cannot run.

4.3.1 Socket LGA775 CPU Installation

NOTE:

To enable Hyper-Threading Technology, the CPU, chipset and operating system must all support Hyper-Threading Technology.

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 socket is shown in **Figure 4-1**.

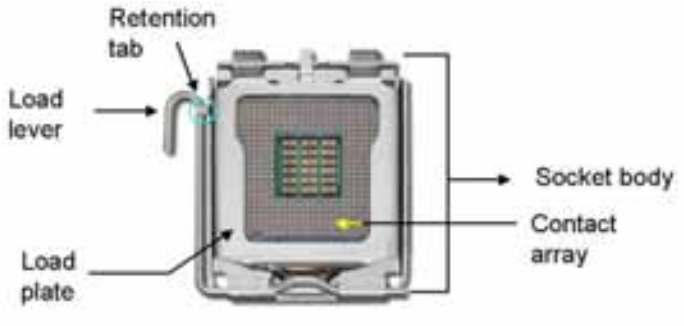

Figure 4-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the MXGF, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off. See **Figure 4-2**.

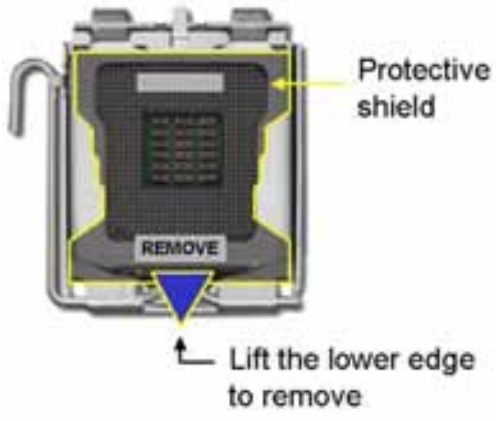

Figure 4-2: Remove the CPU Socket Protective Shield

Step 2: **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open

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position. Then rotate the load plate towards the opposite direction.

See **Figure 4-3**.

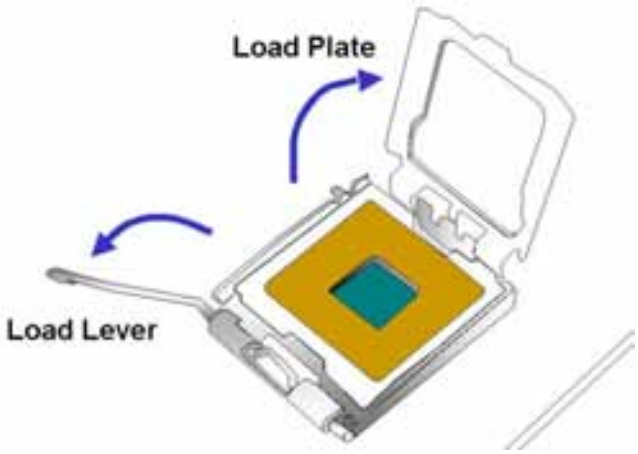

Figure 4-3: Open the CPU Socket Load Plate

Step 3: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly.

See **Figure 4-4**.

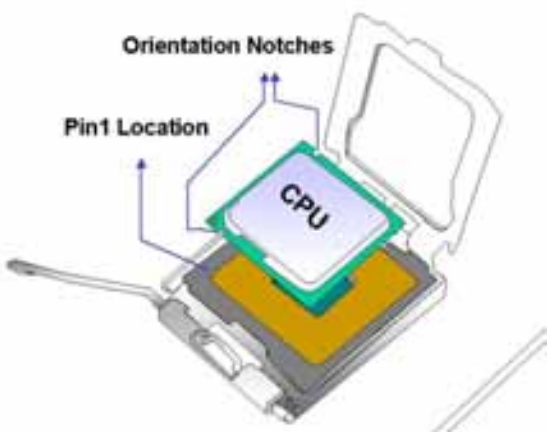

Figure 4-4: Insert the Socket LGA775 CPU

Step 8: **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

Step 9: **Connect the CPU 12 V cable to the 12** After the cooling kit is installed connect the CPU cable to the CPU 12 V power connector.

4.3.2 Socket LGA775 Cooling Kit Installation

WARNING:

It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the MXGF.

The cooling kit includes a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

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Figure 4-5: Cooling Kit

A Socket LGA775 CPU cooling kit shown in **Figure 4-5** can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

Step 1: **Place the cooling kit onto the socket LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit**. Make sure the four spring screw fasteners can pass through the pre-drilled holes on the PCB.

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

Step 4: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 4-6**)

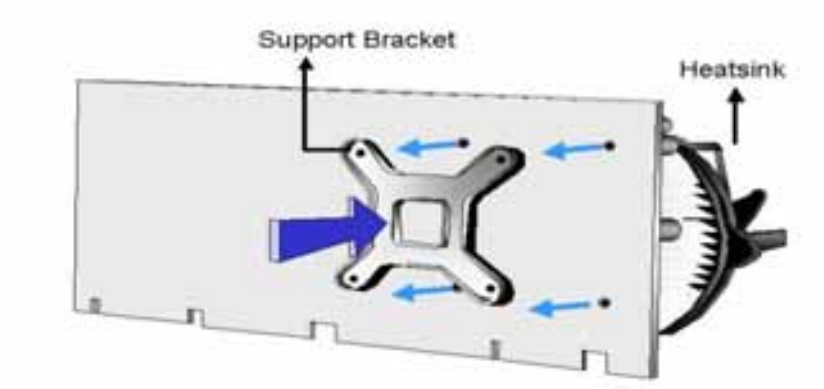

Figure 4-6: Securing the Heat sink to the PCB Board

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the MXGF. Carefully route the cable and avoid heat generating chips and fan blades.

4.3.3 DIMM Installation

WARNING:

Using incorrectly specified memory modules may cause permanent damage the MXGF. Please make sure the memory modules comply with the recommended memory specifications.

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WARNING:

1) Before removing the DDR2 DRAM module, make sure the AC power supply is completely turned off. Incorrect usage may cause permanent damage to the MXGF series or the DRAM module because the MXGF series supports the iAMT feature which provides power to the DRAM module when the MXGF is off.

2) Do not disconnect the ATX connector when MXGF series power is on. Please make sure to switch off the ATX power supply prior to disconnecting the ATX connector. Incorrect usage may cause permanent damage to the MXGF series.

3) If the MXGF series fails to boot due to improper usage, please clear the CMOS by disconnecting the battery from the connector.

To install a DIMM, please follow the steps below and refer to **Figure 4-7**.

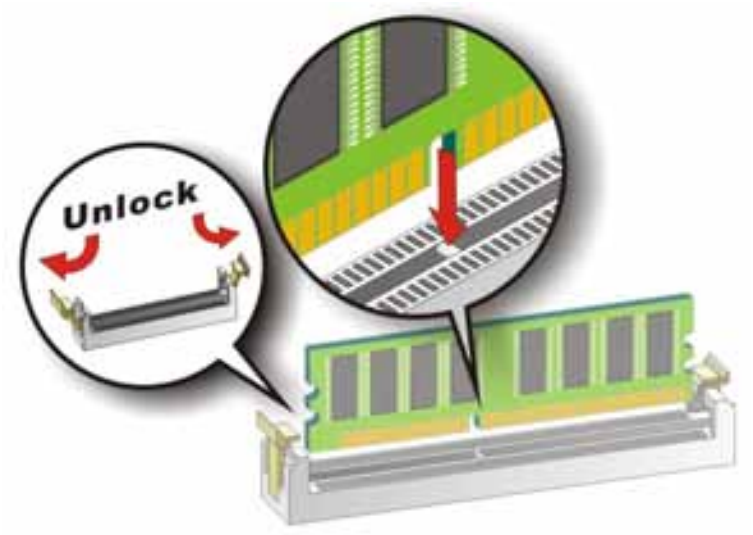


Figure 4-7: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 4-7**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 4-7**.

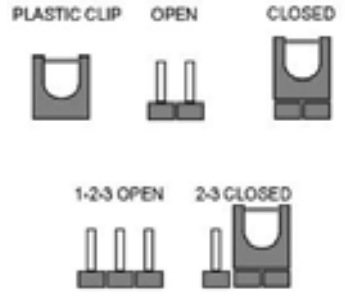
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 4-7**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

4.4 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.



Jumper

Before the MXGF is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the MXGF are listed in **Table 4-1**.

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Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header
iTPM setup jumpers	JTPM1 JTPM2	2-pin header

Table 4-1: Jumpers

4.4.1 Clear CMOS Jumper

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-8**

If the MXGF fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 4-2**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 4-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-8** below.

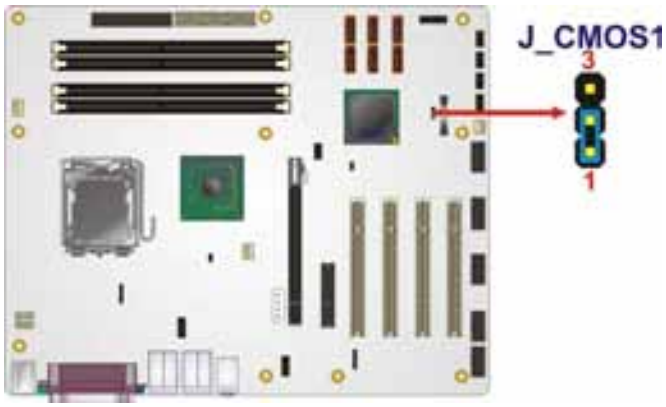

Figure 4-8: Clear CMOS Jumper

4.4.2 iTPM Setup Jumper

Jumper Label: **JTPM1 and JTPM2**

Jumper Type: 2-pin headers

Jumper Settings: See **Table 4-2**

Jumper Location: See **Figure 4-8**

The iTPM setup jumper settings are shown in **Table 4-2**. Close pins 1 and 2 on both JTPM1 and JTPM2 to enable iTPM. All other settings disable iTPM.

AT Power Select	Description	
Open 1 - 2	Disable iTPM	Default
Short 1 - 2	Enable iTPM	

Table 4-3: iTPM Setup Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-8** below.

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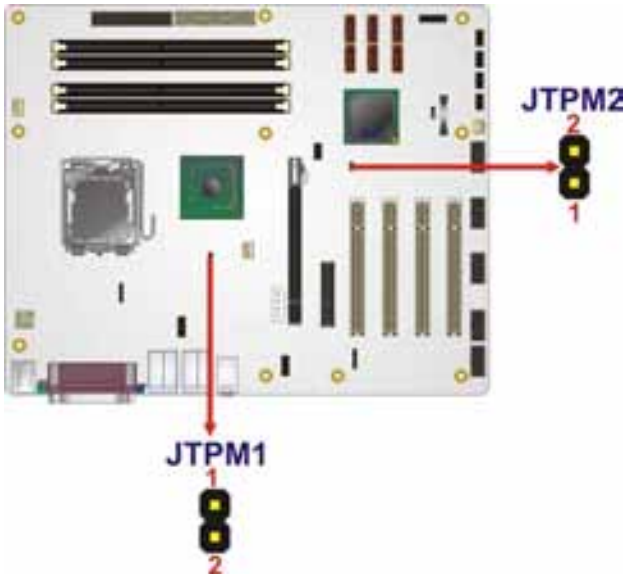

Figure 4-9: iTPM Setup Jumper Locations

4.5 Chassis Installation

To install the MXGF motherboard into the chassis please refer to the reference material that came with the chassis.

4.5.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the MXGF must have air vents to allow cool air to move into the system and hot air to move out.

The MXGF must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

4.5.2 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 4-10**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

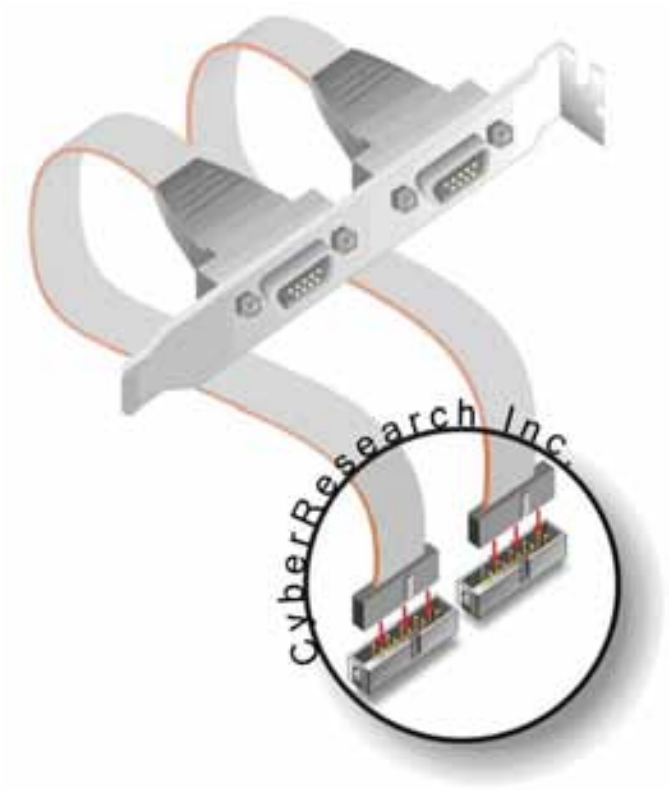

Figure 4-10: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured on a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis

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4.5.3 Single RS-232 Cable with Slot Bracket

The single RS-232 cable consists of one serial port connectors attached to a serial communications cable that is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the single RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connector into the serial port box header. See **Figure 4-11**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

Figure 4-11: Single RS-232 Cable Installation

Step 3: **Secure the bracket**. The single RS-232 connector has one D-sub 9 male connector secured to a bracket. To secure the bracket to the chassis please refer to the reference material that came with the chassis.

4.5.4 SATA Drive Connection

The MXGF is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the on-board SATA drive connector. See **Figure 4-12**.

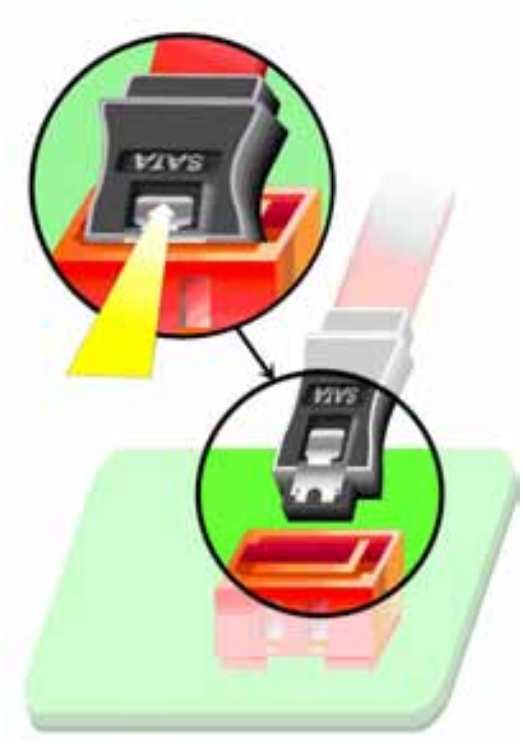

Figure 4-12: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-13**.

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NOTE:

The SATA power cable is an optional item that must be purchased separately.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 4-13**.

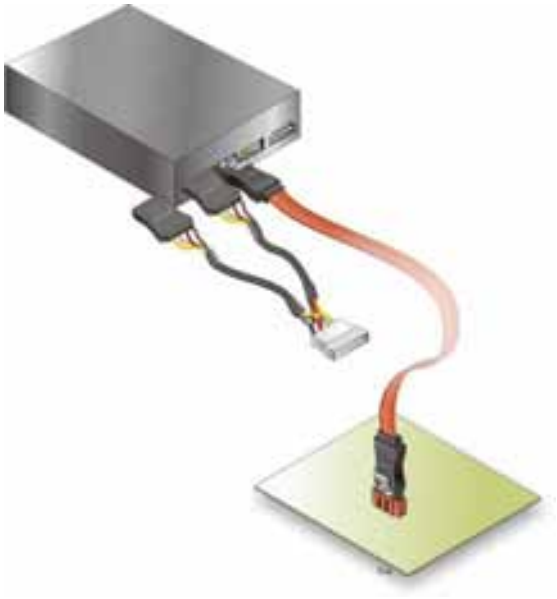

Figure 4-13: SATA Power Drive Connection

4.5.5 USB Cable (Dual Port) with Slot Bracket

The MXGF is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 3**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the MXGF USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the MXGF, connect the cable connectors to the on-board connectors. See **Figure 4-14**.

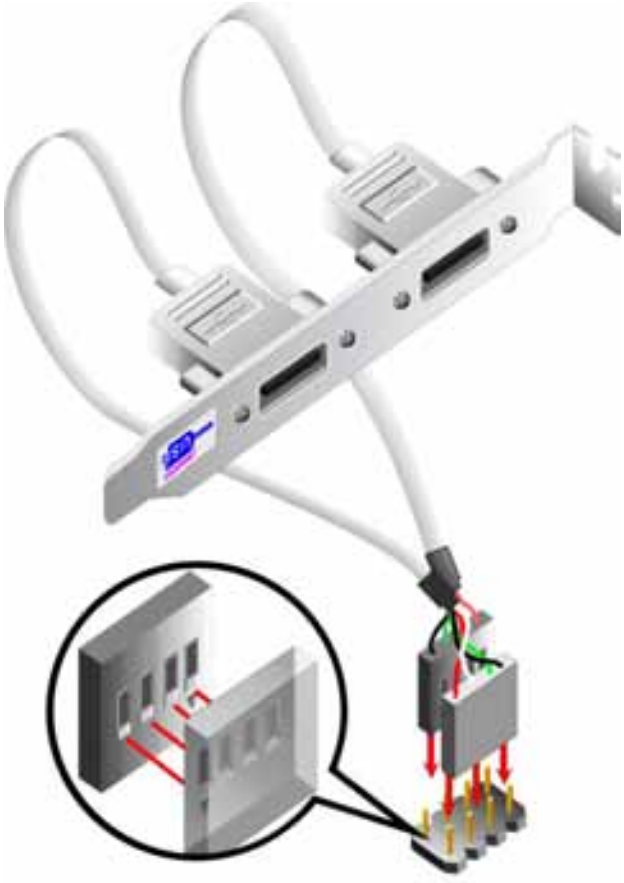

Figure 4-14: Dual USB Cable Connection

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Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.5.6 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from CyberResearch, Inc. To install a four port USB cable onto the MXGF, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the USB connectors are shown in **Chapter 4**.

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the MXGF USB connectors.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the MXGF, connect the cable connectors to the on-board connectors. See **Figure 4-14**.

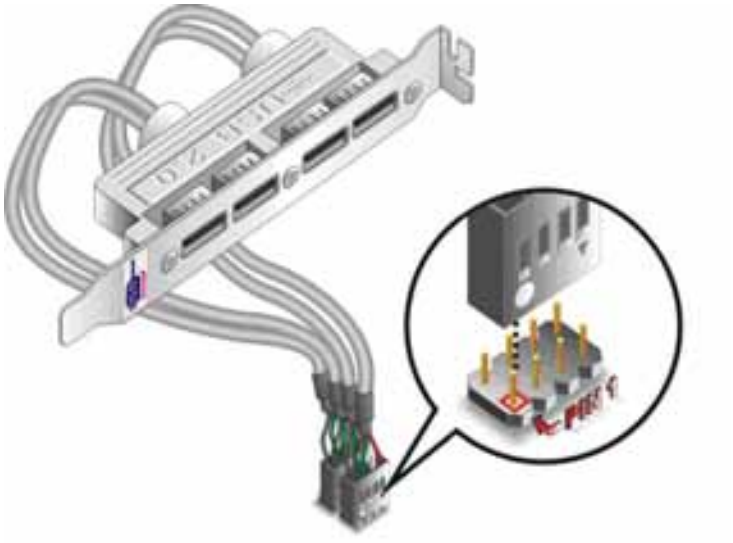

Figure 4-15: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

4.6 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Keyboard and mouse
- Serial port devices
- VGA screens
- Parallel port devices
- Ethernet connection
- USB devices
- Audio devices

To install these devices, connect the corresponding cable connector from the actual device to the corresponding MXGF external peripheral interface connector making sure the pins are properly aligned.

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4.6.1 Keyboard and Mouse

The MXGF has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the MXGF.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 4-16**.

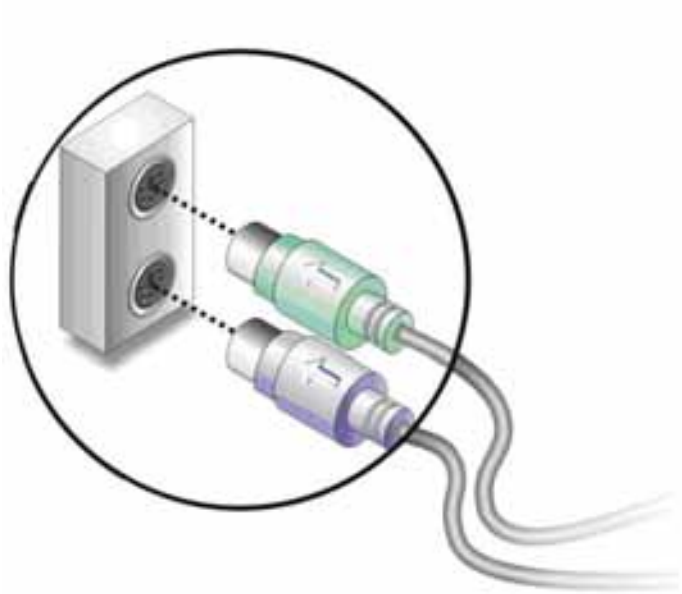

Figure 4-16: PS/2 Keyboard/Mouse Connector

4.6.2 LAN

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the MXGF. See **Figure 4-17**.

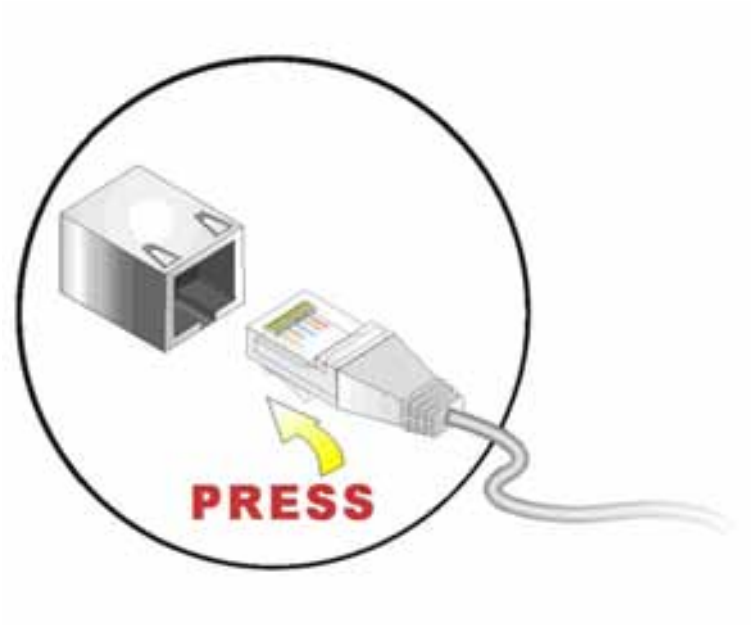

Figure 4-17: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

4.6.3 Parallel Device Connection

The MXGF has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the MXGF.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 2: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See **Figure 4-18**.

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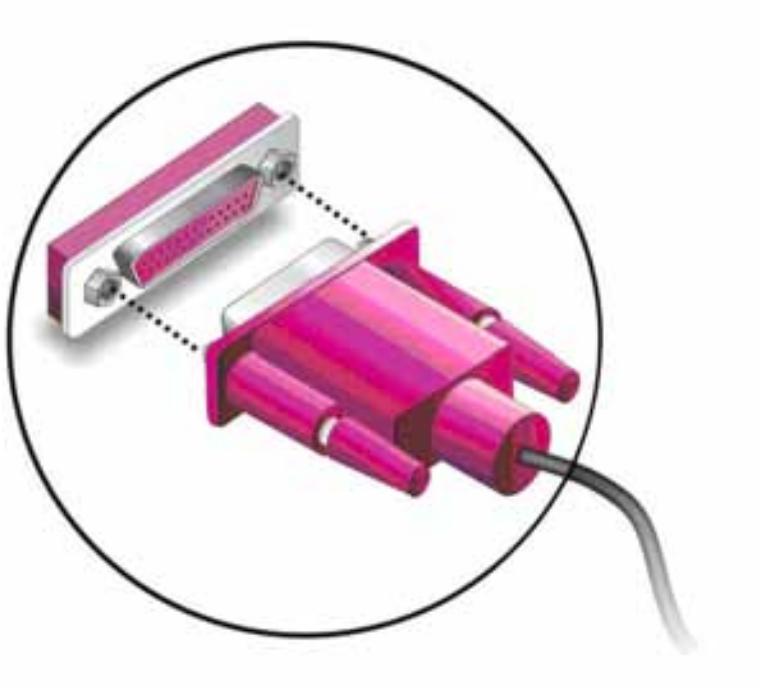

Figure 4-18: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

4.6.4 Serial Device

The MXGF has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the MXGF.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 4-19**.

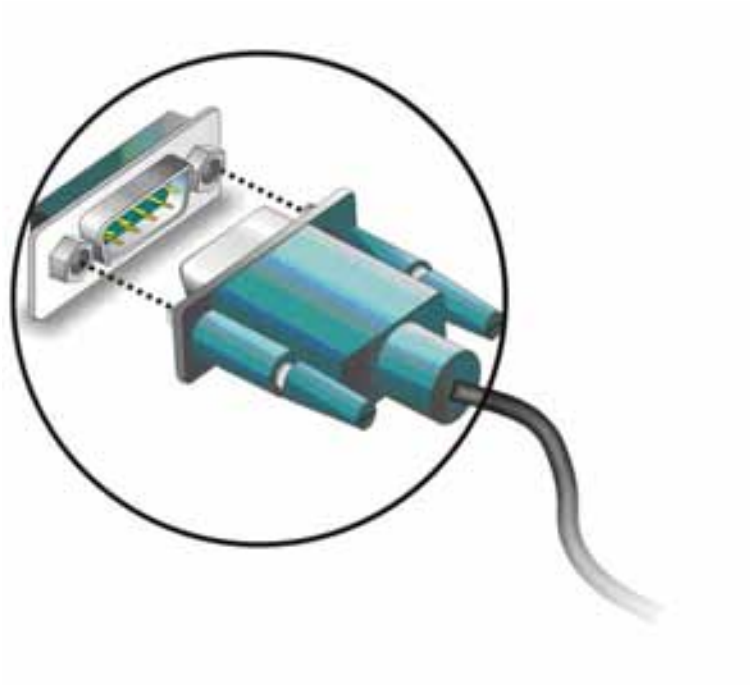

Figure 4-19: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

4.6.5 USB

The external USB connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the MXGF.

Step 1: **Locate the USB connectors**. The location of the USB receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB plug**. Insert the USB plug of a device into the USB receptacle on the external peripheral interface. See **Figure 4-20**.

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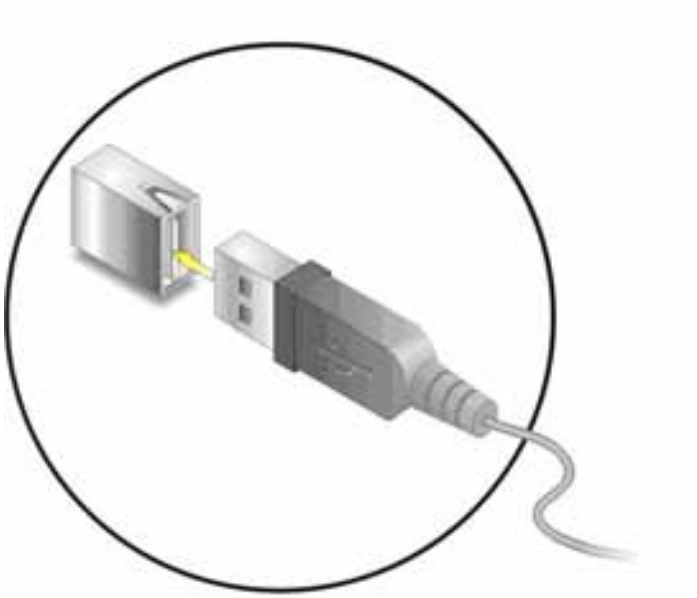

Figure 4-20: USB Connector

4.6.6 VGA Monitor

The MXGF has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the MXGF, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the MXGF. See **Figure 4-21**.

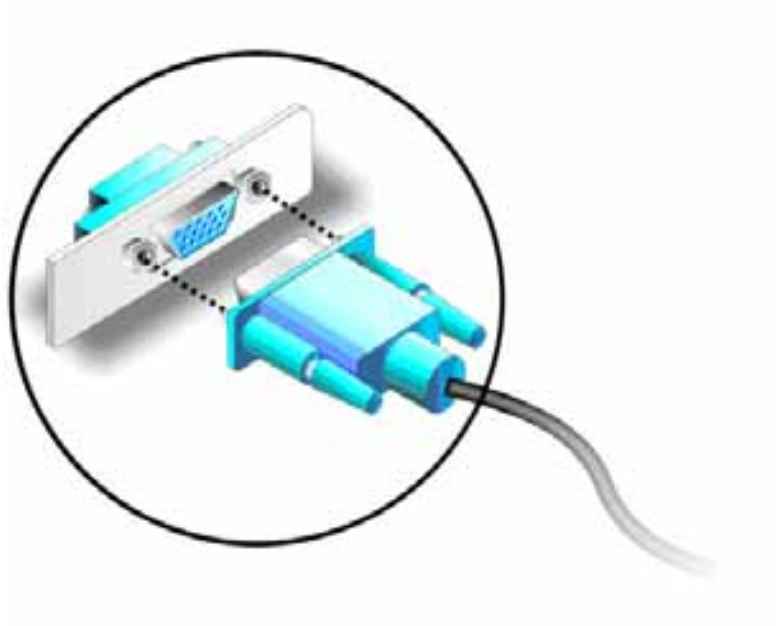

Figure 4-21: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

4.6.7 Audio Connector

The three audio jacks on the external audio connector enable the MXGF to be connected to a stereo sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: **Plug the audio plugs into the audio jacks**. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.

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- **Line Out port (Lime):** Connects to a headphone or a speaker.
- **Microphone (Pink):** Connects to a microphone.

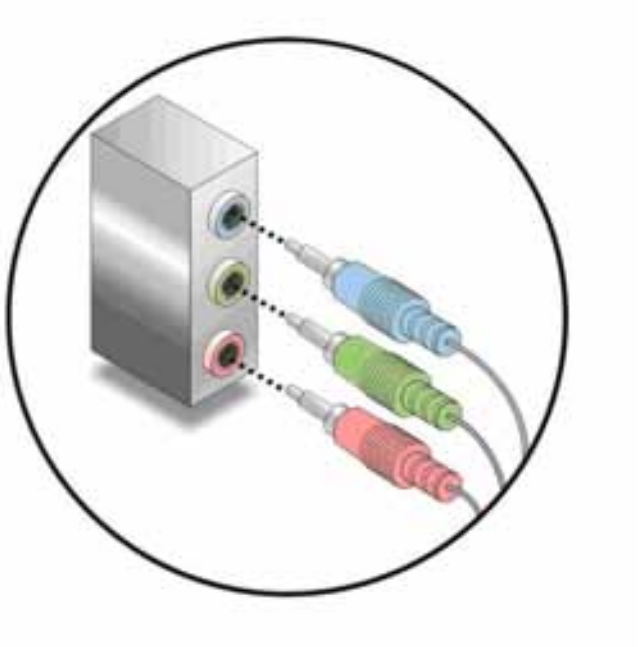

Figure 4-22: Audio Connector

Step 3: **Check audio clarity**. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

Chapter

5

BIOS Setup

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5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

1. Press the **DELETE** key as soon as the system is turned on or
2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen. 0.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
Page Up key	Increase the numeric value or make changes
Page Dn key	Decrease the numeric value or make changes

Key	Function
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

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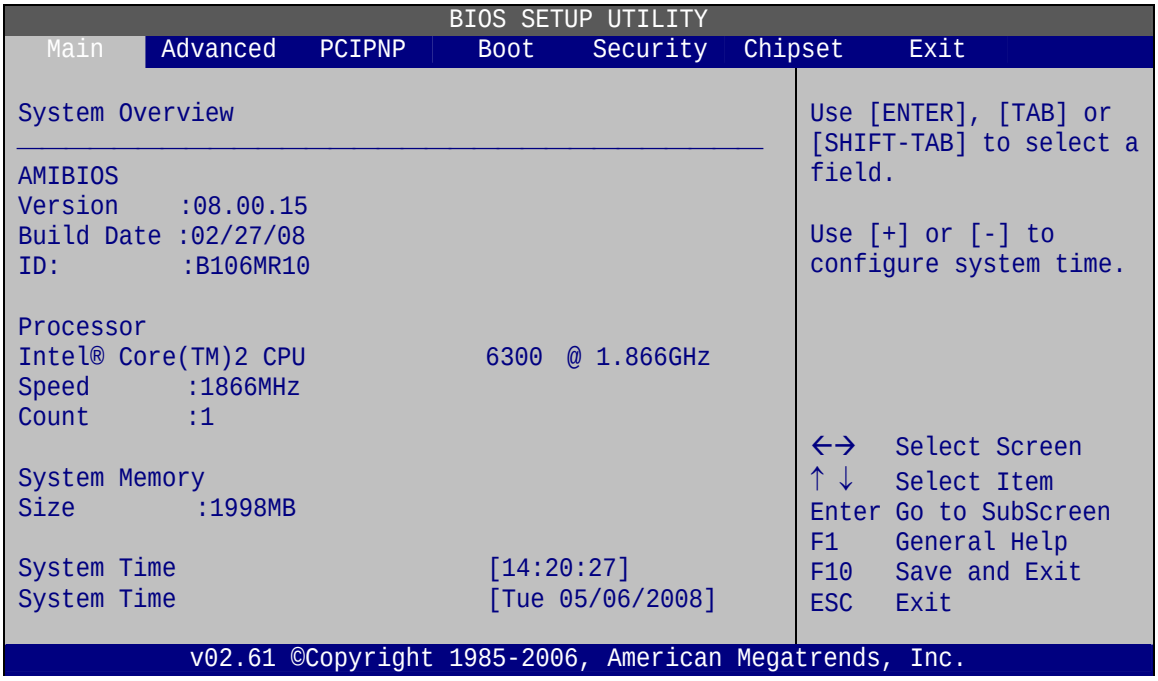
5.2 Main

The Main BIOS menu appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS Menu 1: Main

➔ System Overview

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor

- **Speed**: Lists the processor speed
- **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **Size**: Lists memory size

The System Overview field also has two user configurable fields:

➔ **System Time [hh:mm:ss]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [DAY dd/mm/yyyy]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

Use the **Advanced** menu to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

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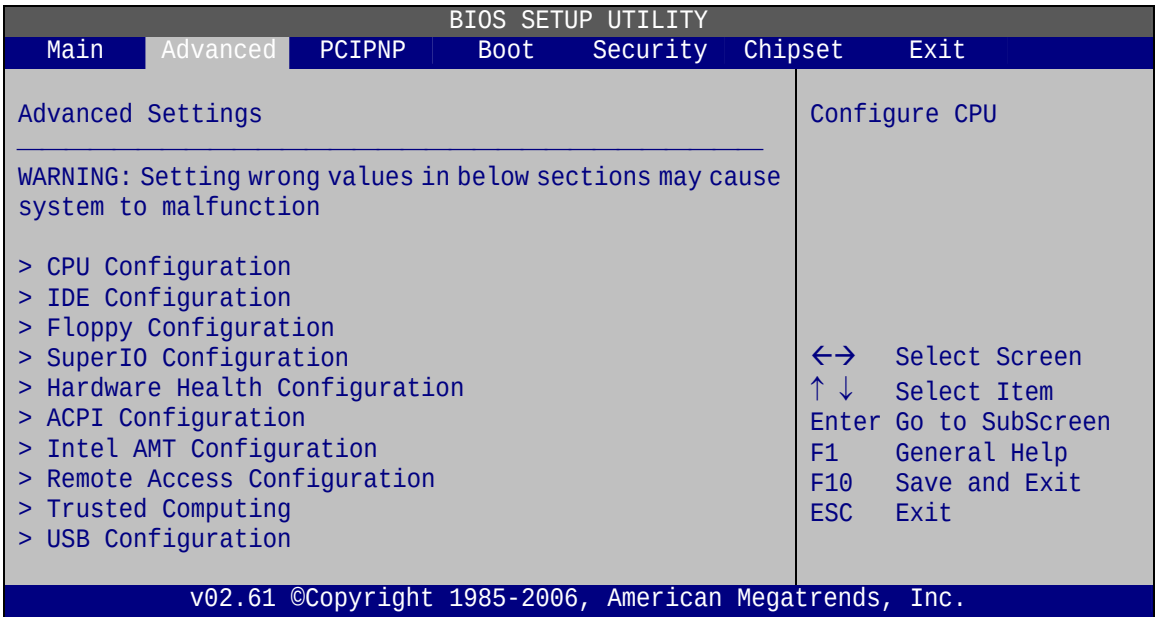
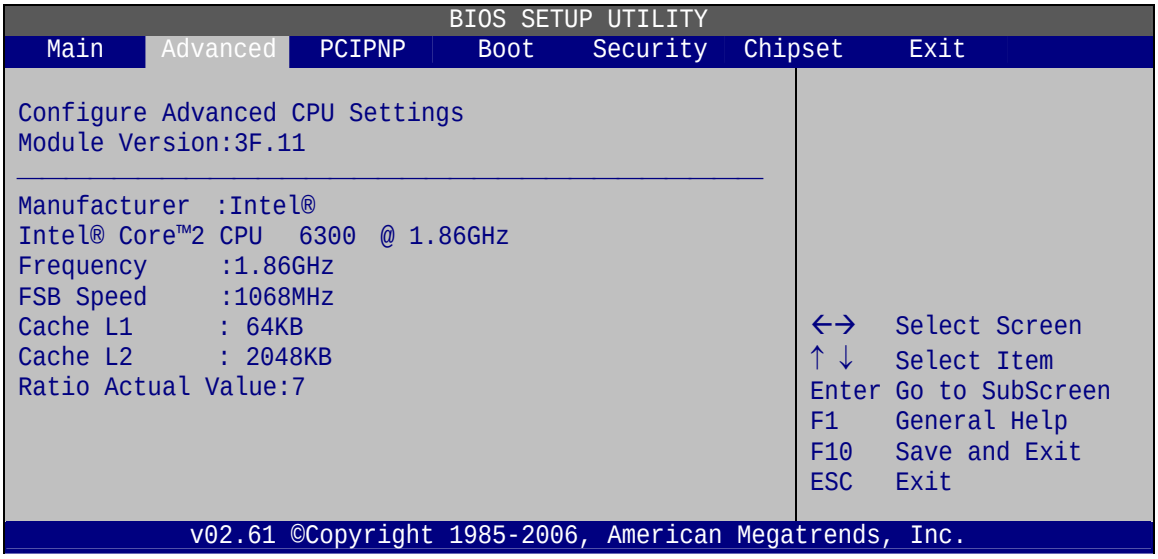


BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the CPU Configuration menu to view detailed CPU specifications and configure the CPU.



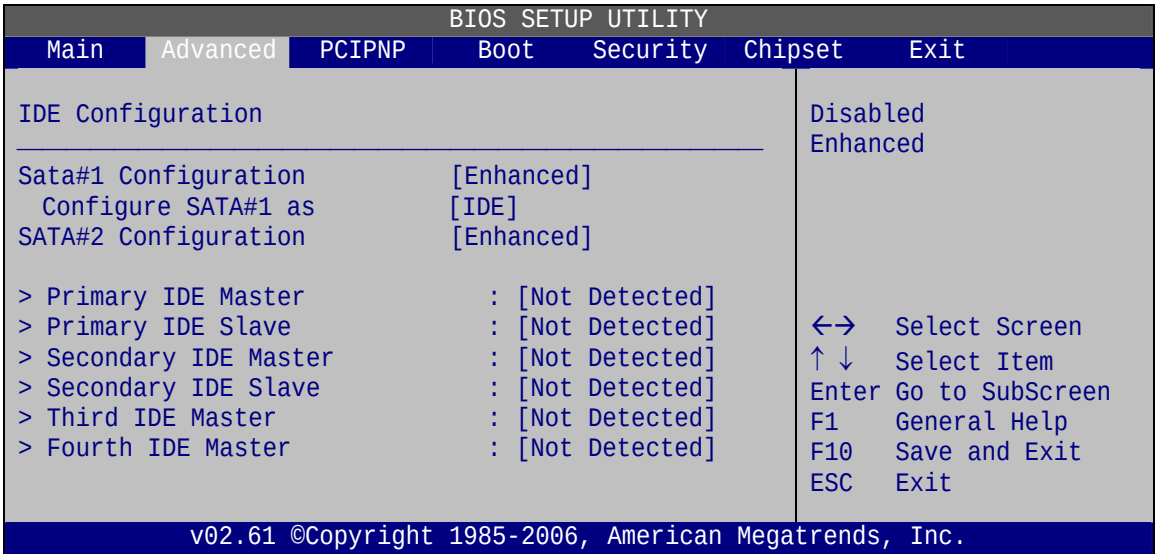
BIOS Menu 3: CPU Configuration

The CPU Configuration menu lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size
- **Ratio Actual**: Clock speed ratio

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (as shown below) to change and/or set the configuration of the IDE devices installed in the system.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
IDE Configuration
Sata#1 Configuration [Enhanced]
Configure SATA#1 as [IDE]
SATA#2 Configuration [Enhanced]
> Primary IDE Master : [Not Detected]
> Primary IDE Slave : [Not Detected]
> Secondary IDE Master : [Not Detected]
> Secondary IDE Slave : [Not Detected]
> Third IDE Master : [Not Detected]
> Fourth IDE Master : [Not Detected]
Disabled
Enhanced
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 ©Copyright 1985-2006, American Megatrends, Inc.

BIOS Menu 4: IDE Configuration

➔ **SATA#n Configuration [Enhanced]**

Use the **SATA#n** BIOS option to enable the nth SATA drive port.

➔ **Enhanced** **DEFAULT** The nth SATA drive port is activated

➔ **Disabled** The nth SATA drive port is disabled

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➔ **Configure SATA#n as [IDE]**

Use the **Configure SATA#n as** BIOS option to configure the nth SATA port as an IDE drive, a SATA drive (AHCI mode) or a SATA drive in a RAID configuration.

➔ **IDE**	**DEFAULT**	The drive connected to the nth SATA port is configured as an IDE drive
➔ **RAID**		The SATA drive connected to the nth SATA drive port is specified as a SATA drive that is part of a RAID array
➔ **AHCI**		The SATA drive connected to the nth SATA drive port is specified as a normal SATA drive.

➔ **IDE Master and IDE Slave**

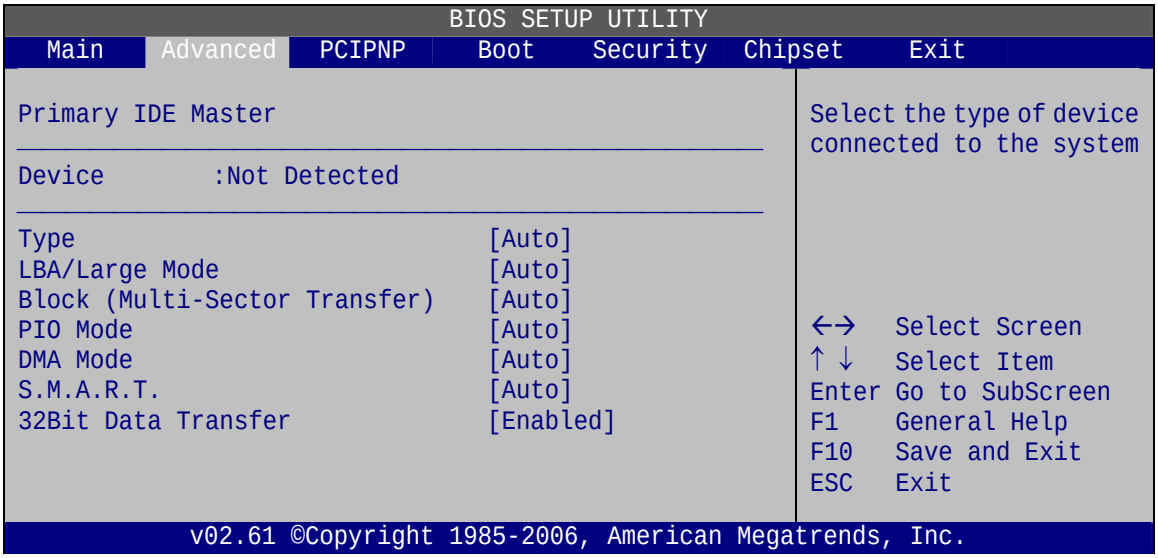
When entering setup, BIOS automatically detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master
- Fourth IDE Master

The **IDE Configuration** menu allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

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- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**		BIOS is prevented from using the LBA mode control on the specified channel.
➔ **Auto**	**DEFAULT**	BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**		BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.
➔ **Auto**	**DEFAULT**	BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s
➔ **3**		PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
➔ **4**		PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s (This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

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➔ **Auto** **DEFAULT** BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **SWDMA0** Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s

➔ **SWDMA1** Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s

➔ **SWDMA2** Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s

➔ **MWDMA0** Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s

➔ **MWDMA1** Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s

➔ **MWDMA2** Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA1** Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s

➔ **UDMA1** Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s

➔ **UDMA2** Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

➔ **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**	**DEFAULT**	BIOS auto detects HDD SMART support.
➔ **Disabled**		Prevents BIOS from using the HDD SMART feature.
➔ **Enabled**		Allows BIOS to use the HDD SMART feature

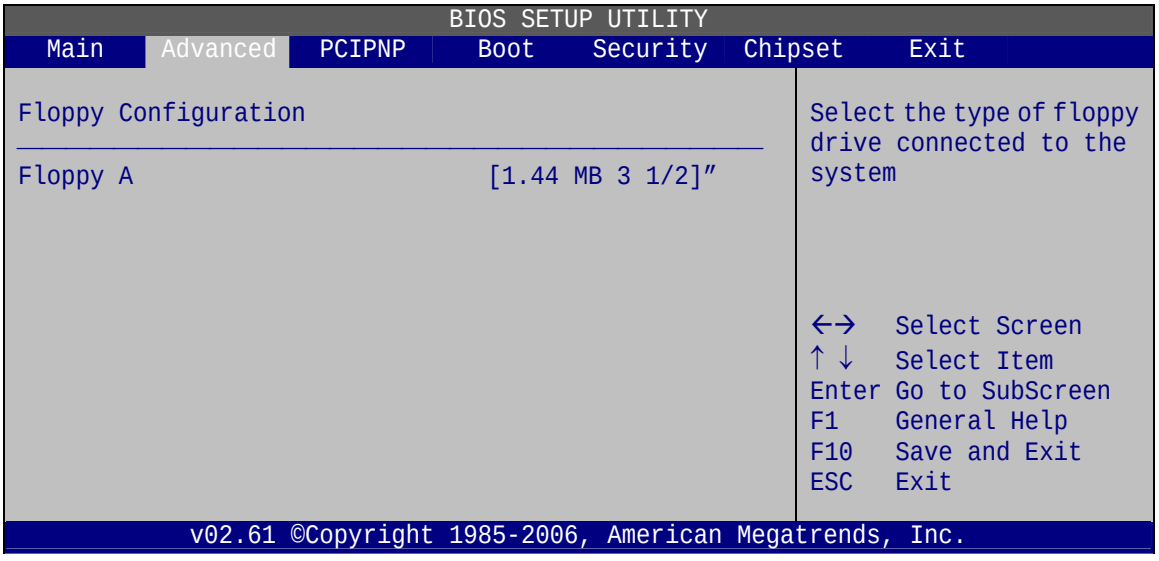
➔ **32Bit Data Transfer [Enabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔ **Disabled**		Prevents the BIOS from using 32-bit data transfers.
➔ **Enabled**	**DEFAULT**	Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Floppy Configuration

Use the **Floppy Configuration menu** to configure the floppy disk drive connected to the system.



BIOS Menu 6: IDE Master and IDE Slave Configuration

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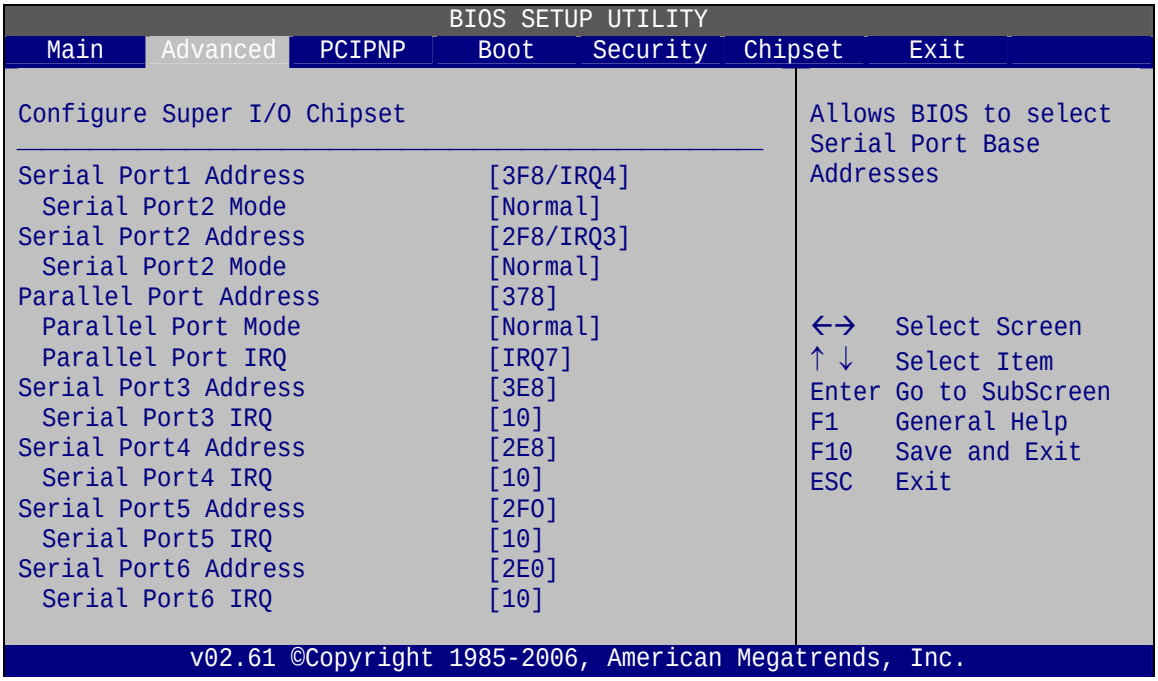
➔ **Floppy A**

Use the **Floppy A/B** option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2’
- 2.88 MB 31/2”

5.3.4 Super I/O Configuration

Use the **Super I/O Configuration** menu (as shown below) to set or change the configurations for the FDD controllers, parallel ports and serial ports.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Configure Super I/O Chipset
Serial Port1 Address [3F8/IRQ4]
Serial Port2 Mode [Normal]
Serial Port2 Address [2F8/IRQ3]
Serial Port2 Mode [Normal]
Parallel Port Address [378]
Parallel Port Mode [Normal]
Parallel Port IRQ [IRQ7]
Serial Port3 Address [3E8]
Serial Port3 IRQ [10]
Serial Port4 Address [2E8]
Serial Port4 IRQ [10]
Serial Port5 Address [2F0]
Serial Port5 IRQ [10]
Serial Port6 Address [2E0]
Serial Port6 IRQ [10]
Allows BIOS to select Serial Port Base Addresses
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 7: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port1 Mode [Normal]**

Use the **Serial Port1 Mode** option to select the Serial Port1 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 1 mode is normal
➔ **IrDA**		Serial Port 1 mode is IrDA
➔ **ASK IR**		Serial Port 1 mode is ASK IR

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA

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➔ **ASK IR** Serial Port 2 mode is ASK IR

➔ **Parallel Address [378]**

The **Parallel Port Address** BIOS option assigns the I/O port address of the parallel port. The following address options are available:

➔ **Disabled**		No I/O port address is assigned to the parallel port
➔ **378**	**DEFAULT**	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

The Parallel Port Mode selection selects the mode the parallel port operates in.

➔ **Normal**	**DEFAULT**	The normal parallel port mode is the standard mode for parallel port operation.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

➔ **EPP + ECP** The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port becomes compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

The **Parallel Port Address** BIOS option assigns the parallel port interrupt address. The following address options are available.

➔ **IRQ5** Parallel port interrupt address is IRQ5

➔ **IRQ7** **DEFAULT** Parallel port interrupt address is IRQ7

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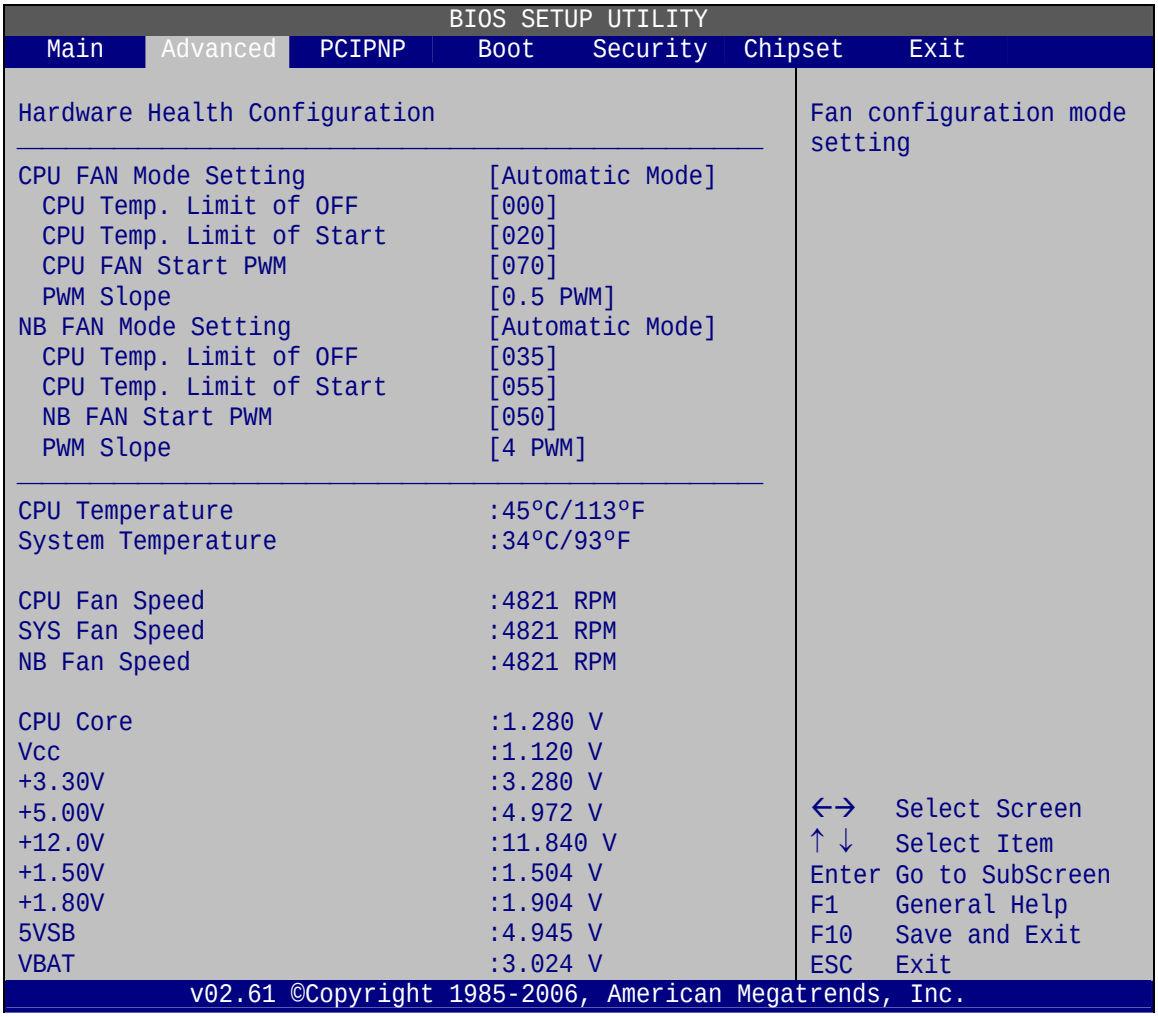
5.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hardware Health Configuration
CPU FAN Mode Setting [Automatic Mode]
CPU Temp. Limit of OFF [000]
CPU Temp. Limit of Start [020]
CPU FAN Start PWM [070]
PWM Slope [0.5 PWM]
NB FAN Mode Setting [Automatic Mode]
CPU Temp. Limit of OFF [035]
CPU Temp. Limit of Start [055]
NB FAN Start PWM [050]
PWM Slope [4 PWM]
CPU Temperature :45°C/113°F
System Temperature :34°C/93°F
CPU Fan Speed :4821 RPM
SYS Fan Speed :4821 RPM
NB Fan Speed :4821 RPM
CPU Core :1.280 V
Vcc :1.120 V
+3.30V :3.280 V
+5.00V :4.972 V
+12.0V :11.840 V
+1.50V :1.504 V
+1.80V :1.904 V
5VSB :4.945 V
VBAT :3.024 V
Fan configuration mode setting
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 8: Hardware Health Configuration

➔ **FAN Mode Setting [Full On Mode]**

Use the **FAN Mode Setting** option to configure the fan mode options for the following fans:

- CPU fan
- NB fan
- System fan

The fan mode setting options are listed below.

➔ **Full On Mode**	**DEFAULT**	Fan is on all the time
➔ **Automatic mode**		Fan is off when the temperature is low enough. Parameters must be set by the user.

When the **FAN Mode Setting** option is in the **Automatic Mode**, the following parameters can be set.

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Fan Start PWM
- PWM Slope

➔ **CPU Temp. Limit of OFF [000]**

WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

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➔ **CPU Temp. Limit of Start [020]**

WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan 3 Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- Minimum Value: 0°C
- Maximum Value: 127°C

➔ **CPU Fan Start PWM [070]**

The **Fan 3 Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Fan 3 Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature 3 Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan 3 Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **Slope PWM 1 [1 PWM]**

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

- 0.125 PWM
- 0.25 PWM
- 0.5 PWM
- 1 PWM
- 2 PWM
- 4 PWM
- 8 PWM
- 15 PWM

➔ **Hardware Health Monitoring**

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - CPU Temperature
  - System Temperature 1
  - System Temperature 2
- **Fan Speeds**: The CPU cooling fan speed is monitored.
  - CPU fan speed
  - System fan 1 speed
  - System fan 2 speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - DDR2 +1.8 V
  - +3.30 V
  - +5.00 V
  - +12.0 V
  - FSB VTT
  - +1.5 V
  - +1.25 V
  - VBAT

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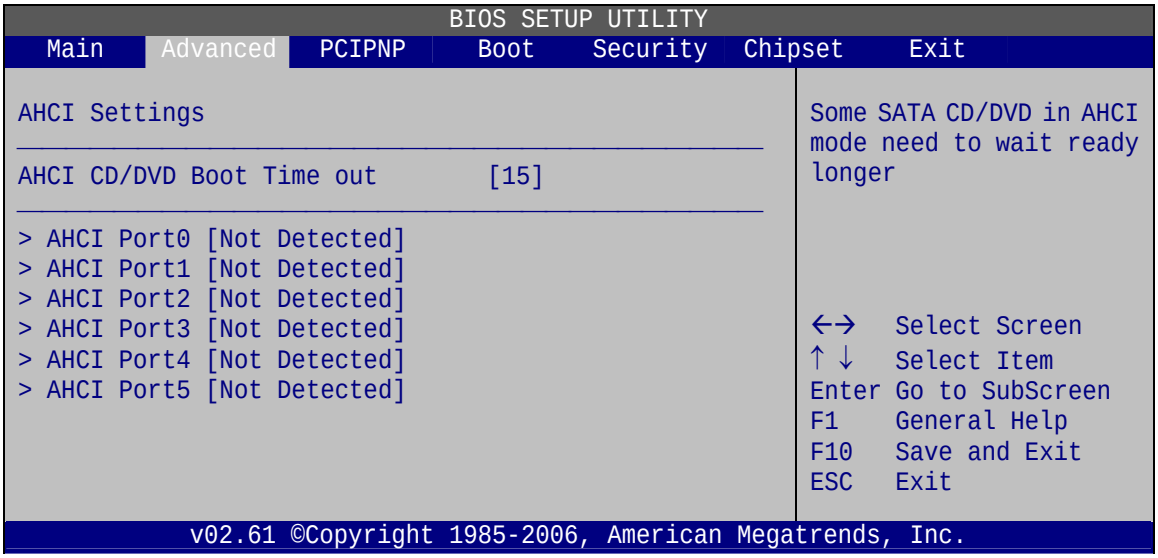
5.3.6 AHCI Configuration

Use the **AHCI Configuration** Settings menu (**BIOS Menu 9**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
AHCI Settings
AHCI CD/DVD Boot Time out [15]
> AHCI Port0 [Not Detected]
> AHCI Port1 [Not Detected]
> AHCI Port2 [Not Detected]
> AHCI Port3 [Not Detected]
> AHCI Port4 [Not Detected]
> AHCI Port5 [Not Detected]
Some SATA CD/DVD in AHCI mode need to wait ready longer
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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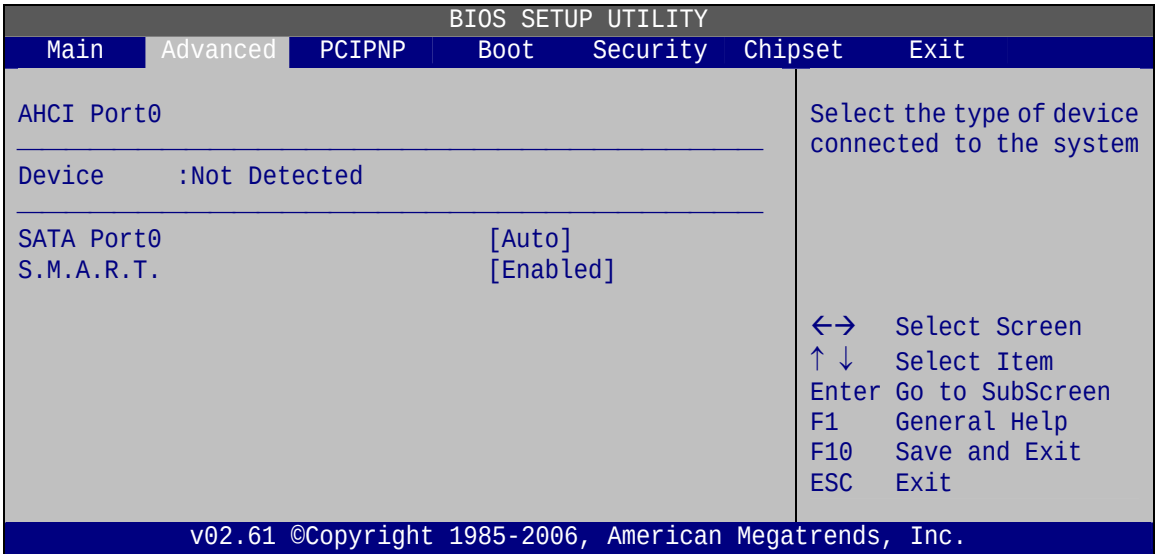
BIOS Menu 9: AHCI Configuration

➔ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check which AHCI (Advanced Host Controller Interface) devices are detected on a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. "**AHCI Port 3**" opens a new window.

5.3.6.1 AHCI Port n

Use the **AHCI Port n** configuration menu (as shown below) to configure the drive connected to SATA connector n.



BIOS Menu 10: AHCI Port n Configuration Menu

➔ **SATA Port n [Auto]**

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

➔ **S.M.A.R.T [Enabled]**

Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

➔ **Enabled** **DEFAULT** S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system

➔ **Disabled** S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

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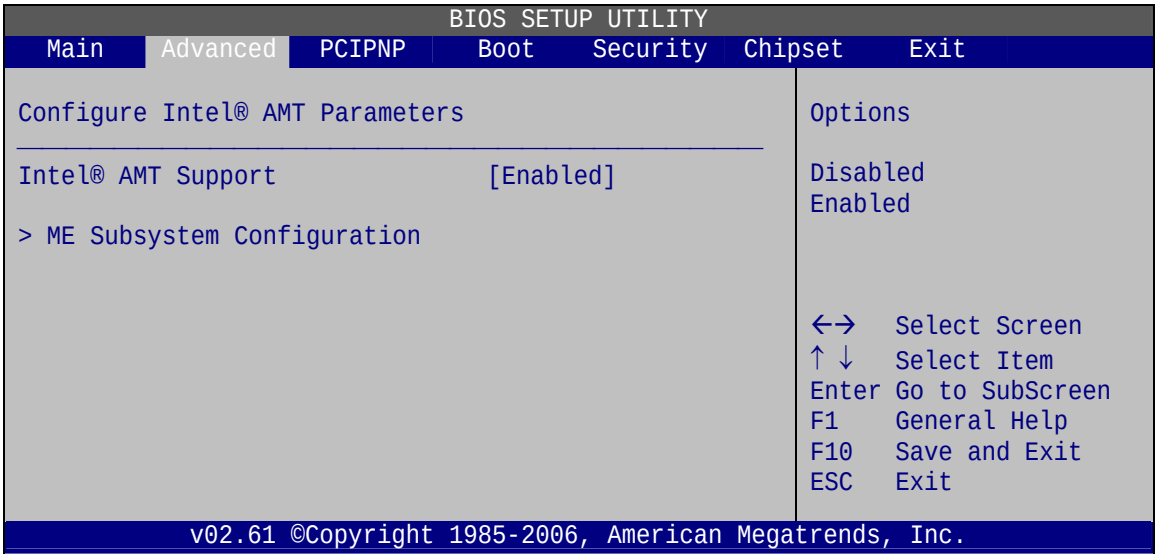
5.3.7 Intel AMT Configuration

Use the **Intel AMT** menu (as shown below) to enable the system to be managed through the Intel® Active Management Technology (AMT) interface. The interface is implemented through LAN1.



BIOS Menu 11: Intel AMT Configuration

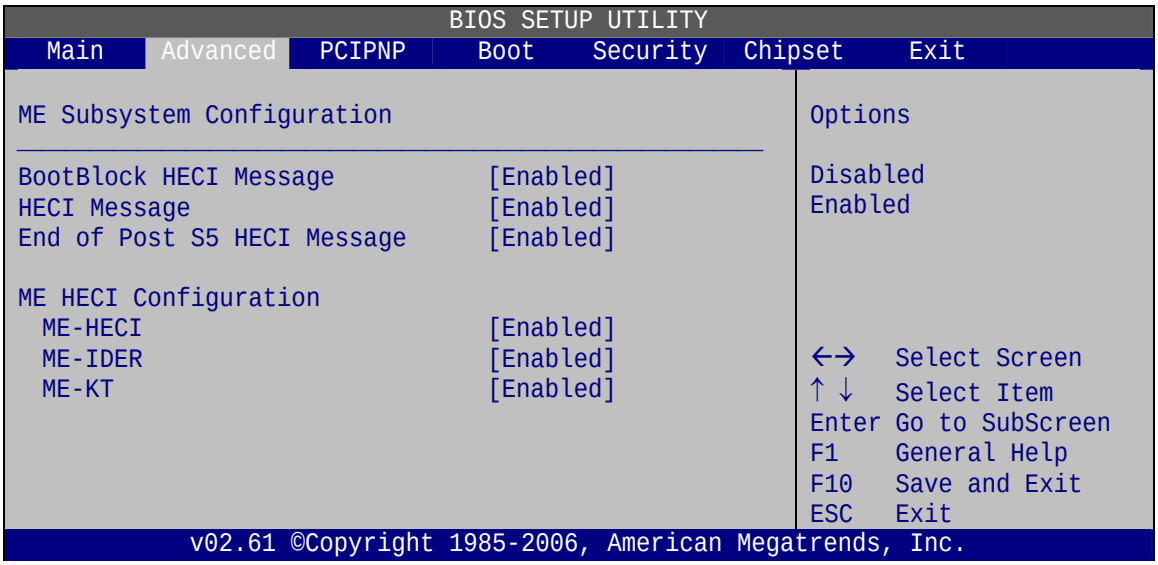
➔ **Intel AMT Support (Disabled)**

Use the **Intel AMT Support** option to enable or disable Intel AMT on the system.

➔	**Disabled**	**DEFAULT**	Intel® AMT disabled
➔	**Enabled**		Intel® AMT enabled

5.3.7.1 ME Subsystem Configuration

Use the ME Subsystem Configuration menu (as shown below) to configure the Intel® Management Engine (ME) configuration options.



BIOS Menu 12: ME Subsystem Configuration

➔ **BootBlock HECI Message [Enabled]**

Use the **BootBlock HECI Message** option to enable or disable boot disk sector that contains the Intel® AMT Host-Embedded Controller Interface (HECI) message.

➔ **Disabled**		Boot sector disabled
➔ **Enabled**	**DEFAULT**	Boot sector enabled

➔ **HECI Message [Enabled]**

Use the **HECI Message** option to enable or disable the Intel® AMT Host-Embedded Controller Interface (HECI) message.

➔ **Disabled**		HECI message disabled
➔ **Enabled**	**DEFAULT**	HECI message enabled

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➔ **End of Post S5 HECI Message [Enabled]**

Use the **End of Post S5 HECI Message** option to enable or disable the Intel® AMT the HECI message to wake the system in an S5 sleep state.

➔ **Disabled**		HECI bus cannot rouse system from an S5 state
➔ **Enabled**	**DEFAULT**	HECI bus can rouse system from an S5 state

➔ **ME-HECI [Enabled]**

This option is not user configurable.

➔ **ME-IDER [Enabled]**

Use the **ME-IDER** option to enable or disable the IDE-Redirection (IDER) protocol. This allows redirection of CD, floppy and DVD drives through the management engine.

➔ **Disabled**		The IDER protocol is disabled
➔ **Enabled**	**DEFAULT**	The IDER protocol is enabled

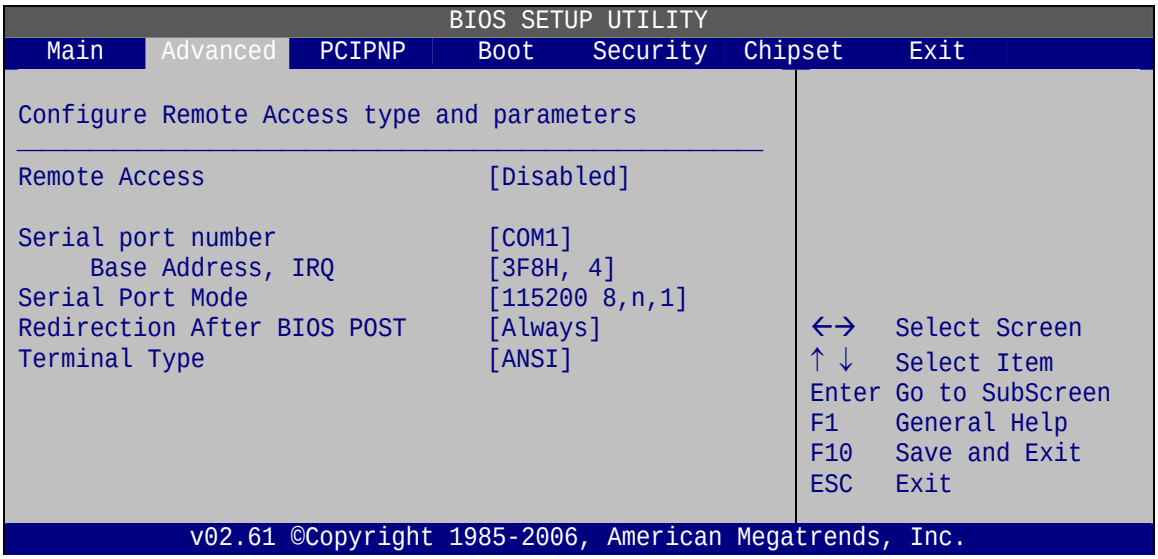
➔ **ME-KT [Enabled]**

Use the **ME-KT** option to enable or disable the Serial Over LAN (SOL) protocol to enable the Intel® AMT enabled to redirect the keyboard/text through the management engine.

➔ **Disabled**		The SOL protocol is disabled
➔ **Enabled**	**DEFAULT**	The SOL protocol is enabled

5.3.8 Remote Access Configuration

Use the **Remote Access Configuration** menu to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Configure Remote Access type and parameters
Remote Access [Disabled]
Serial port number [COM1]
Base Address, IRQ [3F8H, 4]
Serial Port Mode [115200 8,n,1]
Redirection After BIOS POST [Always]
Terminal Type [ANSI]
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 13: Remote Access Configuration

➔ **Remote Access [Disabled]**

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled** **DEFAULT** Remote access is disabled.

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➔ **Enabled** Remote access configuration options shown below appear:
-- Serial Port Number
-- Serial Port Mode
-- Flow Control
-- Redirection after BIOS POST
-- Terminal Type
-- VT-UTF8 Combo Key Support
-- Sredir Memory Display Delay
These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option to select the serial port used for remote access.

➔ **COM1** **DEFAULT** System is remotely accessed through COM1

➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

➔ **Base Address, IRQ [3F8h,4]**

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

➔ **Serial Port Mode [115200 8,n,1]**

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 **DEFAULT**
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

➔ **Redirection After BIOS POST [Always]**

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**		The console is not redirected after POST
➔ **Boot Loader**		Redirection is active during POST and during Boot Loader
➔ **Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

➔ **Terminal Type [ANSI]**

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**	**DEFAULT**	The target terminal type is ANSI
➔ **VT100**		The target terminal type is VT100
➔ **VT-UTF8**		The target terminal type is VT-UTF8

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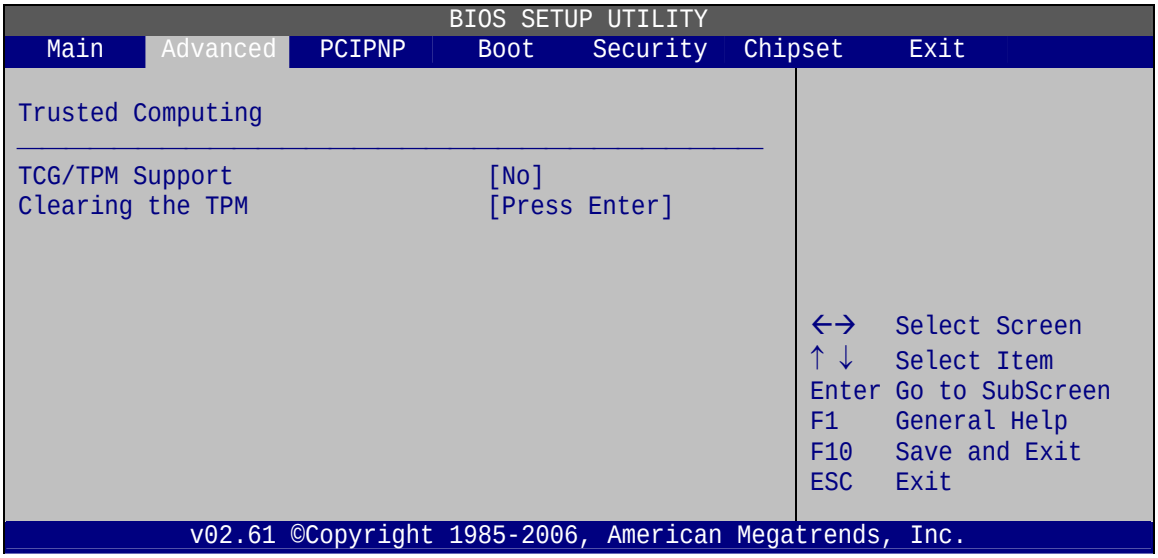
5.3.9 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 14**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 14: Trusted Computing

➔ **TCG/TPM Support [No]**

Use the **TCG/TPM Support** option to configure support for the TPM.

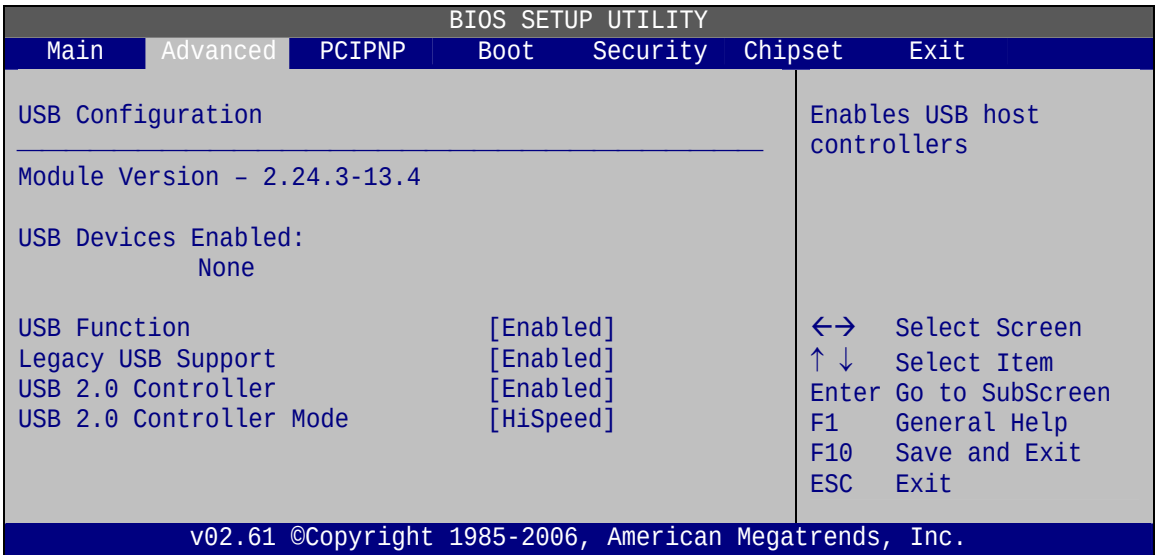
➔ **No** **DEFAULT** TPM support is disabled.

➔ **Yes** TPM support is enabled.

25 Business Park Drive
Branford, CT USA
P: (203) 643-5000; F: (203) 643-5001
www.cyberresearch.com

5.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 15**) to read USB configuration information and configure the USB settings.



BIOS Menu 15: USB Configuration

➔ **USB Functions [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB function support disabled
➔ **Enabled**	**DEFAULT**	USB function support enabled

➔ **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

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➔	**Disabled**		Legacy USB support disabled
➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔	**Disabled**		USB 2.0 controller disabled
➔	**Enabled**	**DEFAULT**	USB 2.0 controller enabled

➔ **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

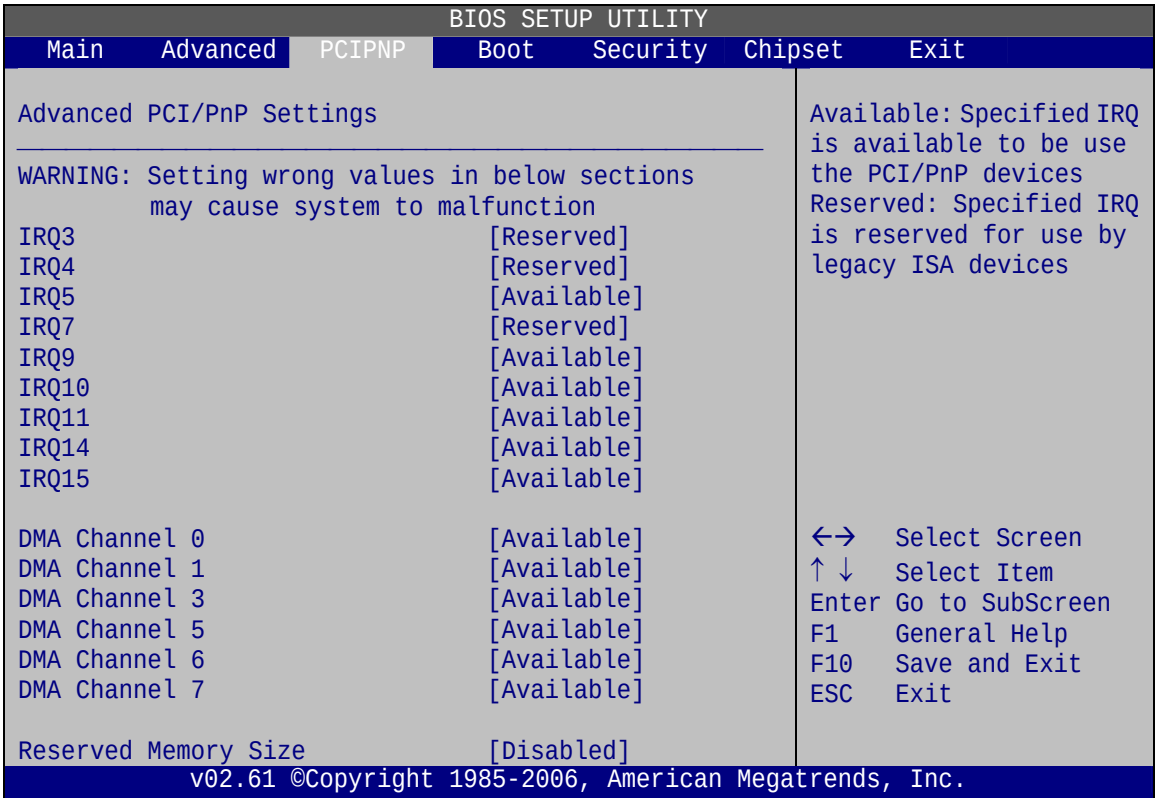
➔	**FullSpeed**		The controller is capable of operating at 12 Mb/s
➔	**HiSpeed**	**DEFAULT**	The controller is capable of operating at 480 Mb/s

5.4 PCI/PnP

Use the PCI/PnP menu to configure advanced PCI and PnP settings.

WARNING:

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections
may cause system to malfunction
IRQ3 [Reserved]
IRQ4 [Reserved]
IRQ5 [Available]
IRQ7 [Reserved]
IRQ9 [Available]
IRQ10 [Available]
IRQ11 [Available]
IRQ14 [Available]
IRQ15 [Available]
DMA Channel 0 [Available]
DMA Channel 1 [Available]
DMA Channel 3 [Available]
DMA Channel 5 [Available]
DMA Channel 6 [Available]
DMA Channel 7 [Available]
Reserved Memory Size [Disabled]
Available: Specified IRQ is available to be use the PCI/PnP devices
Reserved: Specified IRQ is reserved for use by legacy ISA devices
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 16: PCI/PnP Configuration

➔ **IRQ# [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral device.

➔ **Available** **DEFAULT** The specified IRQ is available to be used by PCI/PnP devices

➔ **Reserved** The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7

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- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

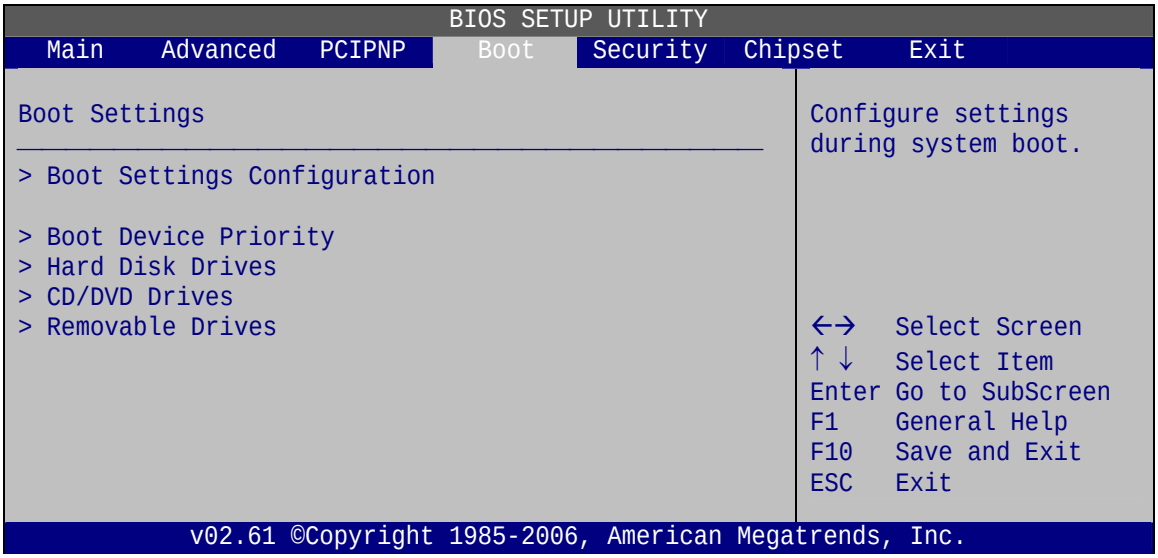
➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16 KB reserved for legacy ISA devices
➔ **32K**		32 KB reserved for legacy ISA devices
➔ **64K**		54 KB reserved for legacy ISA devices

5.5 Boot

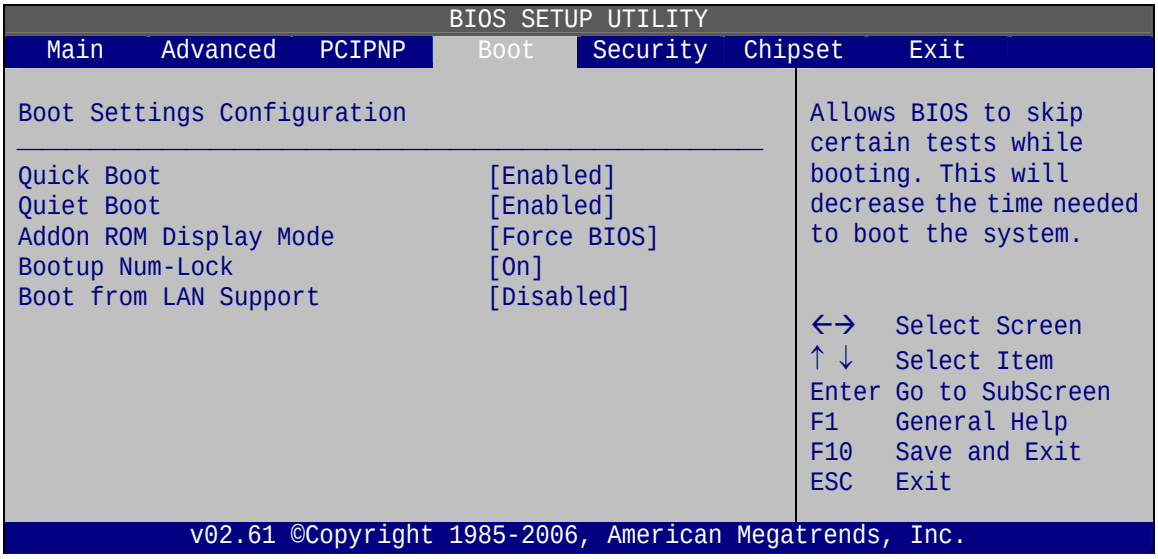
Use the Boot menu (**BIOS Menu 17**) to configure system boot options.



BIOS Menu 17: Boot

5.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 17**) to configure advanced system boot options.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Boot Settings Configuration
Quick Boot [Enabled]
Quiet Boot [Enabled]
AddOn ROM Display Mode [Force BIOS]
Bootup Num-Lock [On]
Boot from LAN Support [Disabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 18: Boot Settings Configuration

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➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**	**DEFAULT**	Allows the computer system to force a third party BIOS to display during system boot.
➔ **Keep Current**		Allows the computer system to display the information during system boot.

➔ **Bootup Num-Lock [Off]**

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

➔ **Off**	**DEFAULT**	Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **GbE LAN Boot (82566) [Disabled]**

The **GbE LAN Boot** option enables remote boot of the system through LAN1. This LAN port also supports remote management using Intel® AMT.

➔ **Disabled** **DEFAULT** Cannot be booted remotely through this port

➔ **Enabled** Can be booted remotely through this port

➔ **Boot From LAN Support (82573L) [Disabled]**

The **BOOT From LAN Support** allows the system to be booted remotely over a network through LAN2.

➔ **Disabled** **DEFAULT** Cannot be booted remotely through this port

➔ **Enabled** Can be booted remotely through this port

5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 19**) to specify the boot sequence from the available devices. The following options are available:

- 1st Boot Device
- 2nd Boot Device
- 3rd Boot Device

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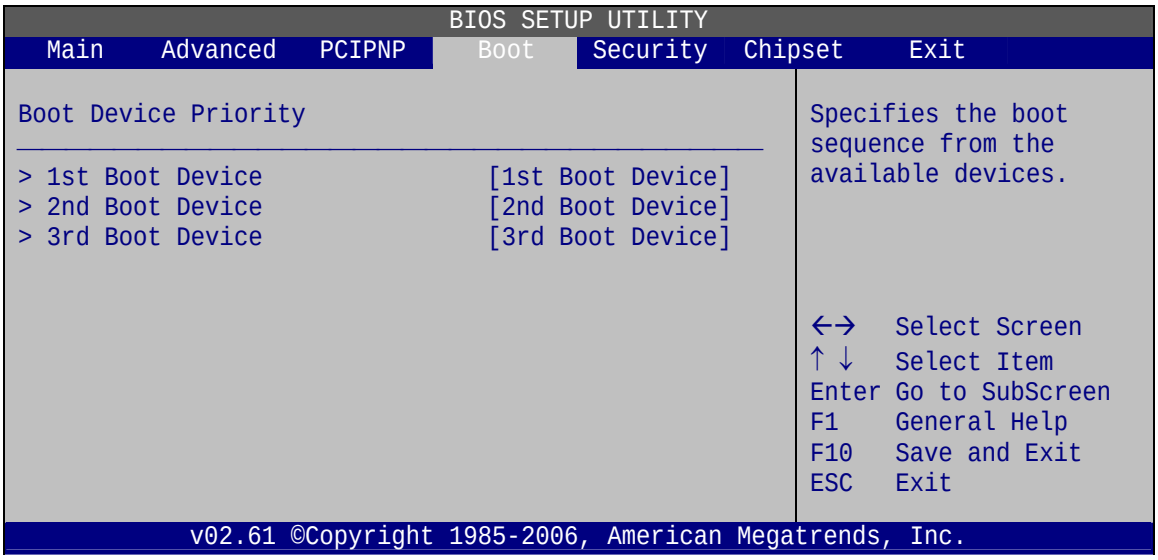
BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Boot Device Priority
> 1st Boot Device [1st Boot Device]
> 2nd Boot Device [2nd Boot Device]
> 3rd Boot Device [3rd Boot Device]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 19: Boot Device Priority Settings

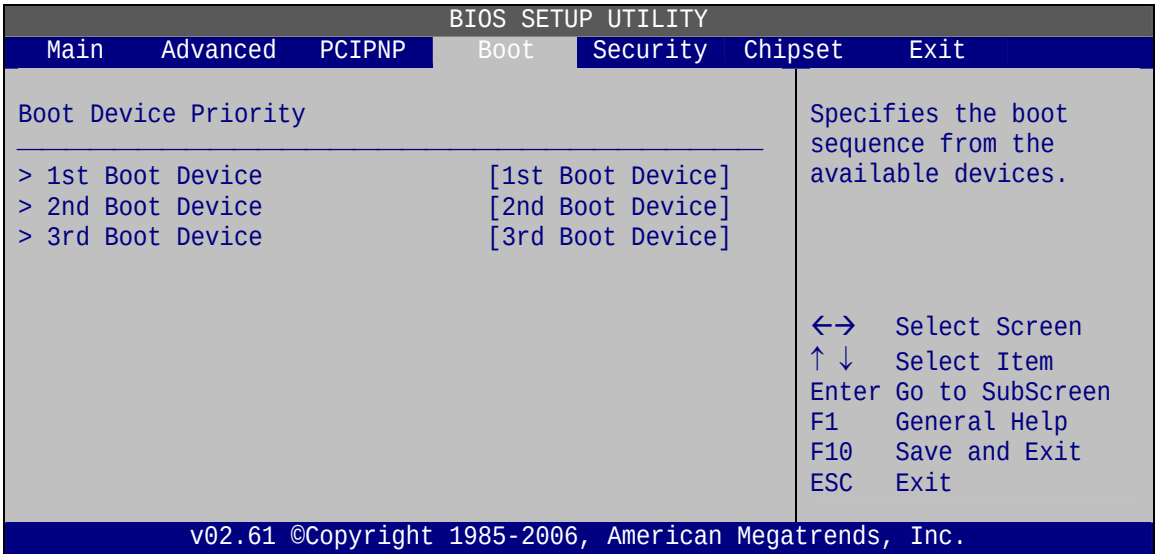
5.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive
- 3rd Drive

NOTE:

Only installed drives are shown in the list.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Boot Device Priority
> 1st Boot Device [1st Boot Device]
> 2nd Boot Device [2nd Boot Device]
> 3rd Boot Device [3rd Boot Device]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 20: Boot Device Priority Settings

5.5.4 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive
- 3rd Drive

NOTE:

Only installed CD and DVD drives are shown in the list

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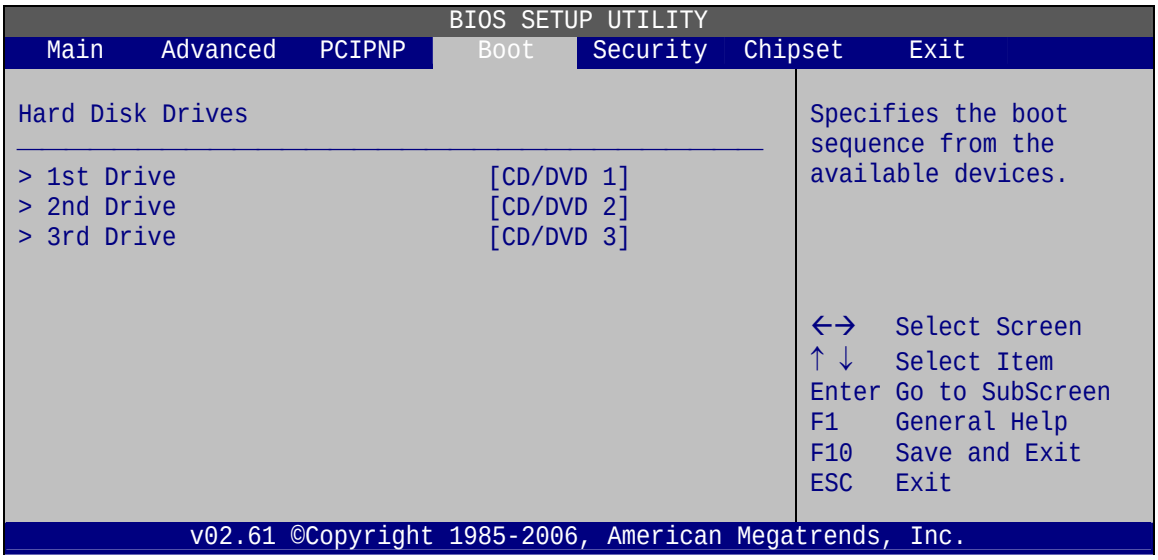
BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hard Disk Drives
> 1st Drive [CD/DVD 1]
> 2nd Drive [CD/DVD 2]
> 3rd Drive [CD/DVD 3]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 21: CD/DVD Drives

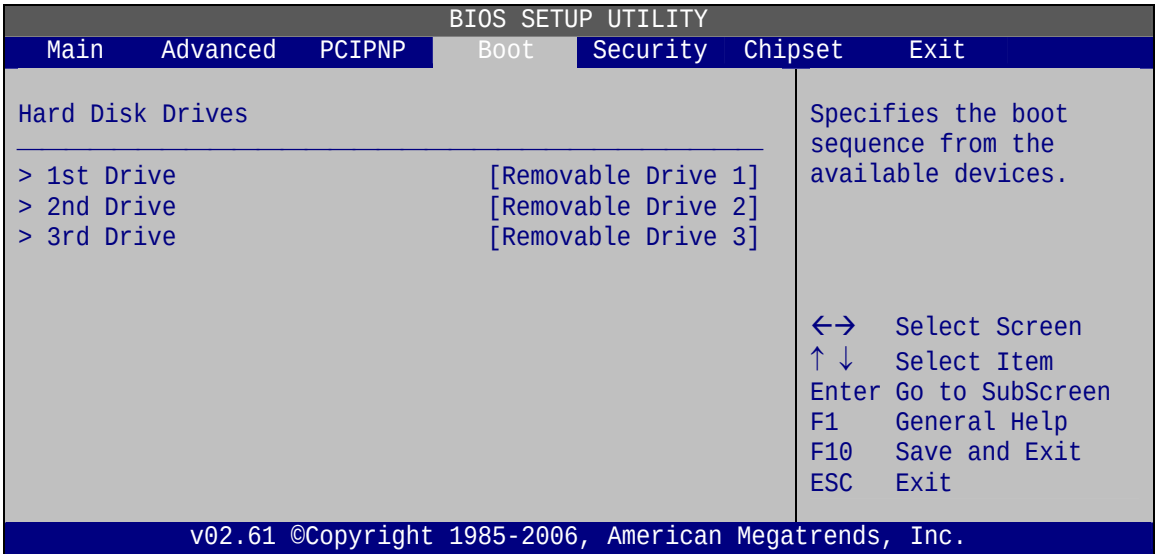
5.5.5 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 22**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive

NOTE:

Only installed removable drives are shown in the list. This menu does not show if there are no removable drives.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Hard Disk Drives
> 1st Drive [Removable Drive 1]
> 2nd Drive [Removable Drive 2]
> 3rd Drive [Removable Drive 3]
Specifies the boot sequence from the available devices.
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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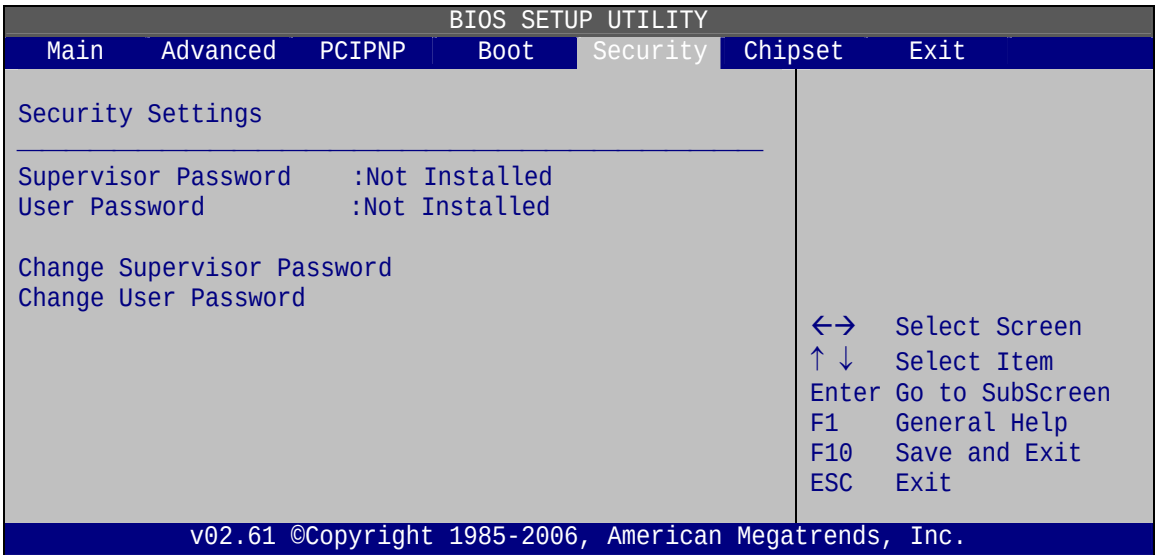
BIOS Menu 22: Removable Drives

5.6 Security

Use the Security menu to set system and user passwords.



BIOS Menu 23: Security

➔ Change Supervisor Password

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select

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this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

➔ **Change User Password**

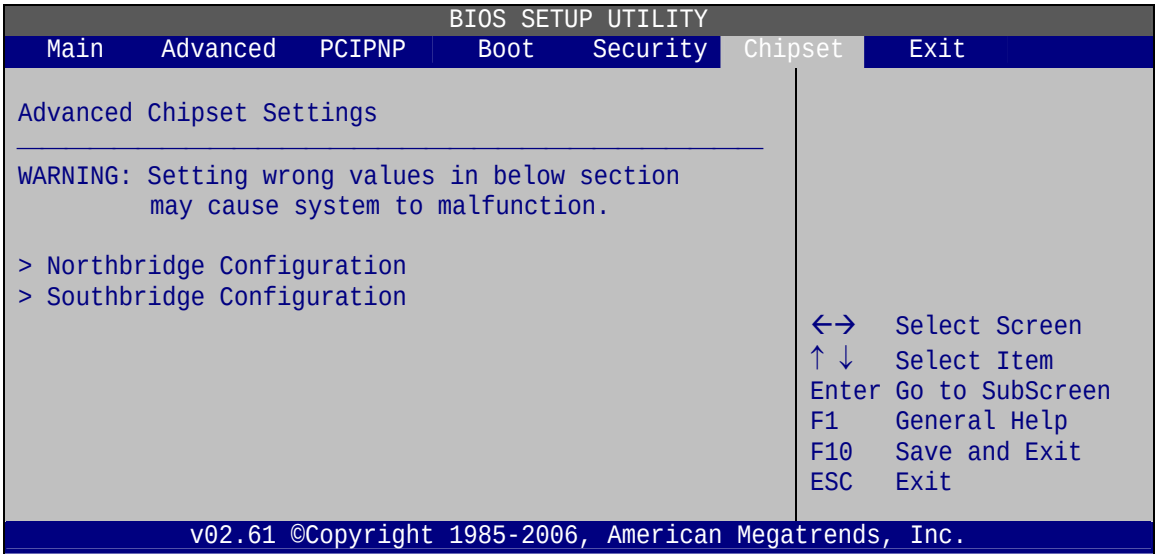
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be cleared, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

5.7 Chipsets

Use the **Chipset** menu to access the Northbridge and Southbridge configuration menus

WARNING:

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Advanced Chipset Settings
WARNING: Setting wrong values in below section
may cause system to malfunction.
> Northbridge Configuration
> Southbridge Configuration
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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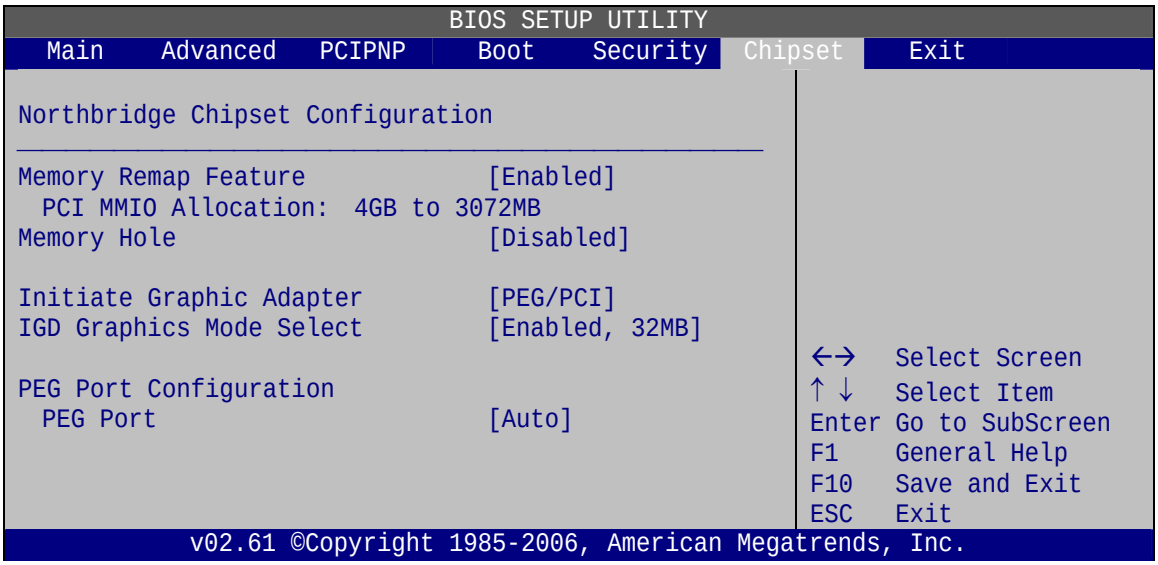
BIOS Menu 24: Chipset

5.7.1 Northbridge Chipset Configuration

Use the Northbridge Chipset Configuration menu to configure the Northbridge chipset settings.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Northbridge Chipset Configuration
Memory Remap Feature [Enabled]
PCI MMIO Allocation: 4GB to 3072MB
Memory Hole [Disabled]
Initiate Graphic Adapter [PEG/PCI]
IGD Graphics Mode Select [Enabled, 32MB]
PEG Port Configuration
PEG Port [Auto]
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 25: Northbridge Chipset Configuration

➔ **Memory Remap Feature [Enabled]**

Use the **Memory Remap Feature** option to allow the overlapped PCI memory above the total physical memory to be remapped. Enabling this option allows full use of 4 GB or more RAM in Windows VISTA, which reports only up to 3.12 GB when this feature is disabled.

➔	**Enabled**	**DEFAULT**	Overlapped PCI memory can be remapped
➔	**Disabled**		Overlapped PCI memory cannot be remapped

➔ **Memory Hole [Disabled]**

The **Memory Hole** reserves the memory space between 15 MB and 16 MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

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- ➔ **Disabled** **DEFAULT** Memory is not reserved for ISA expansion cards
- ➔ **Enabled** Memory is reserved for ISA expansion cards

➔ **Initiate Graphic Adapter**

Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

- IGD
- PEG/IGD
- PEG/PCI **DEFAULT**
- PCI/PEG
- PCI/IGD

➔ **IGD Graphics Mode Select [Enabled, 32 MB]**

The **IGD Graphics Mode Select** option determines the amount of system memory that can be used by the internal graphics device.

- ➔ **Disabled,** Zero memory used by internal graphics device
- ➔ **Enabled, 32 MB** **DEFAULT** 32 MB of memory used by internal graphics device
- ➔ **Enabled, 64 MB** 64 MB of memory used by internal graphics device
- ➔ **Enabled, 128 MB** 128 MB of memory used by internal graphics device

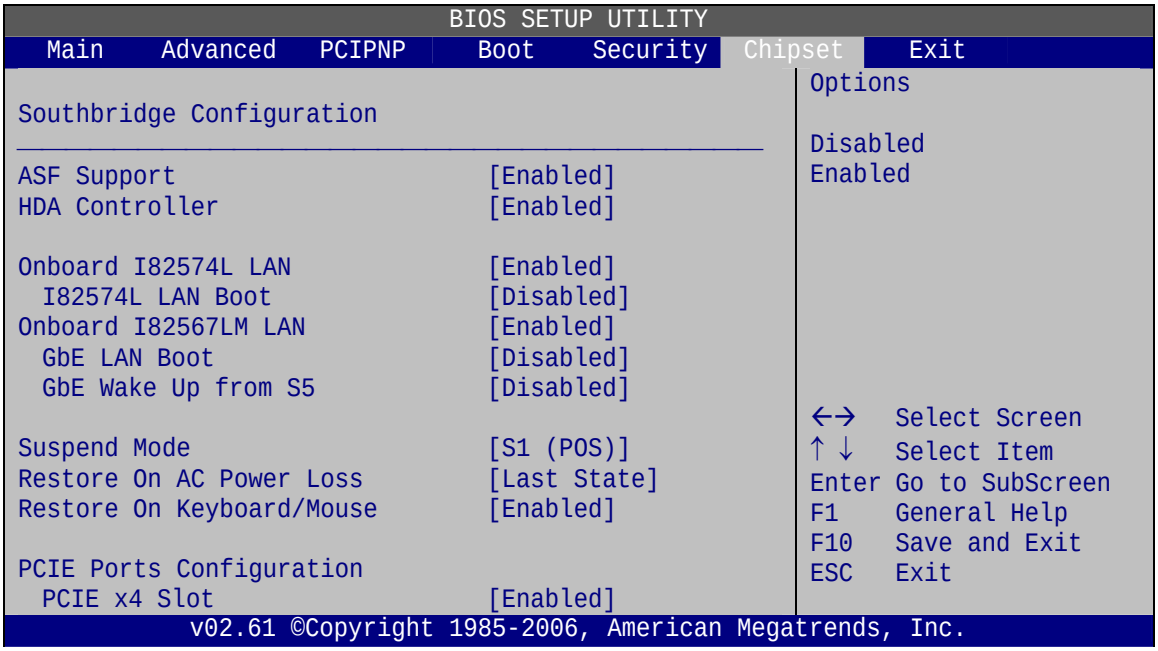
➔ **PEG Port [Enabled]**

Use the **PEG Port** option to enable or disable the PCI Express port.

- ➔ **Disabled** Installed PEG cards cannot function.
- ➔ **Enabled** **DEFAULT** PEG card functions normally.

5.7.2 Southbridge Chipset Configuration

Use the Southbridge Configuration menu to configure the Southbridge chipset.



BIOS Menu 26: Southbridge Chipset Configuration

➔ **HDA Controller [Disabled]**

Use the **HDA Controller** option to enable the Southbridge high definition audio controller. If the optional AC-KIT-833HD has been connected to the system, or any other HDA device, this option should be enabled.

➔ **Disabled** **DEFAULT** Southbridge HDA controller is disabled

➔ **Enabled** Southbridge HDA controller is enabled

➔ **ASF Support [Enabled]**

Use the **ASF Support** BIOS to allow remote management using ASF technology.

➔ **Disabled** The system will not communicate with a remote management server.

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➔ **Enabled** **DEFAULT** The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

➔ **I82574L LAN Boot [Disabled]**

The I82574L **LAN Boot** option enables remote boot of the system through LAN1.

➔ **Disabled** **DEFAULT** Cannot be booted remotely through this port

➔ **Enabled** Can be booted remotely through this port

➔ **GbE LAN Support (I82567LM) [Disabled]**

The GbE LAN **Boot option** allows the system to be booted remotely over a network through LAN2. This LAN port also supports remote management using Intel® AMT.

➔ **Disabled** **DEFAULT** Cannot be booted remotely through this port

➔ **Enabled** Can be booted remotely through this port

➔ **Suspend Mode [S1 (POS)]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.

➔ **S3 (STR)** **DEFAULT** The system enters S3 (STR) sleep state.

➔ **Restore on AC Power Loss [Last State]**

Use the **Restore on AC Power Loss** BIOS option to specify what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off** The system remains turned off

➔ **Power On** The system turns on

➔ **Last State** **DEFAULT** The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

➔ **Resume on Keyboard/Mouse [Disabled]**

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

➔ **Disabled** **DEFAULT** Wake event not generated by activity on the keyboard or mouse

➔ **Enabled** Wake event generated by activity on the keyboard or mouse

➔ **Disabled** **DEFAULT** Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

➔ **PCIE Ports Configuration [Enabled]**

Use the **PCIE Ports Configuration** option to determine enable or disable the PCIE ports.

➔ **Disabled** PCIE port is disabled.

➔ **Enabled** **DEFAULT** PCIE E port is enabled.

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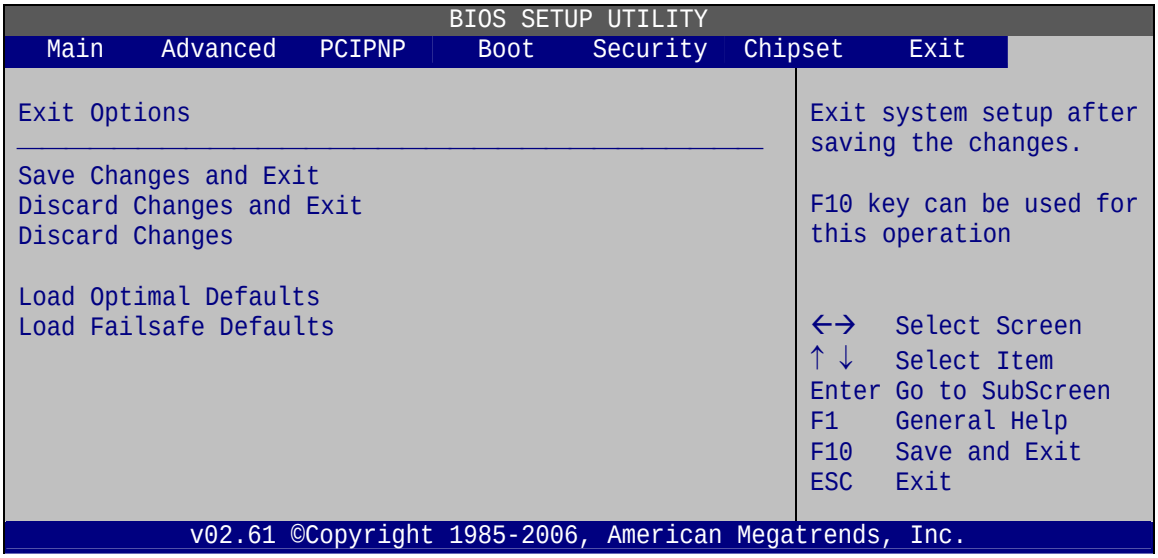
5.8 Exit

Use the **Exit** menu to load default BIOS values, optimal failsafe values and to save configuration changes.


BIOS SETUP UTILITY
Main Advanced PCIPNP Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation
←→ Select Screen
↑ ↓ Select Item
Enter Go to SubScreen
F1 General Help
F10 Save and Exit
ESC Exit
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BIOS Menu 27: Exit

➔ **Save Changes and Exit**

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

➔ **Discard Changes and Exit**

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

➔ **Discard Changes**

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

➔ **Load Optimal Defaults**

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

➔ **Load Failsafe Defaults**

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

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Chapter

6

Software Drivers

6.1 Available Software Drivers

NOTE:

The content of the DVD may vary throughout the life cycle of the product and is subject to change without prior notice. You may visit the CyberResearch website or contact technical support for the latest updates.

The following drivers can be installed on the system.

- Audio drivers
- Chipset drivers
- Network drivers
- Video drivers
- SATA drivers
- Other drivers

Basic Installation instructions are provided below.

6.2 Driver DVD Auto-run

All the drivers for the MXGF Series are on the installation DVD that came with the system. To install the drivers, please follow the steps below.

Important Note:
The following steps must be repeated by the user for each driver installed. To avoid redundancy, these steps are explained below, and referred to in each subsequent section.

Step 1: Insert the DVD into a DVD drive connected to the system.

Step 2: The DVD should autorun. If it does not, double-click on the disk drive containing the "CyberResearch" DVD.

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Figure 6-1: DVD Interface

Step 3: Select “Motherboard/SBC Drivers” as shown in Figure 6-1.

Step 4: Select “MXGF Series” from the secondary menu options as shown in Figure 6-2.

Figure 6-2: Select MXGF Series

Step 5: A tertiary menu appears with a list of available drivers as shown in Figure 6-3.

Figure 6-3: Available Drivers

Step 6: Read subsequent sections in this chapter for installation procedure of each driver.

6.3 Audio Driver Installation

Note:
If you are unsure how to arrive at Figure 6-4 below, see section 6.2 Driver DVD Auto-run before completing next steps.

To install the Audio drivers, please follow the steps below:

Step 1: Choose “Audio Drivers” from the menu as shown below.

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Figure 6-4: Choose Audio Drivers

Step 2: Choose the appropriate operating system as shown in Figure 6-5.

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Figure 6-5: Choose Appropriate Operating System

Step 3: The driver setup and installation process begins as shown below. Follow the InstallShield Wizard prompts to complete the audio driver installation.

6.4 Chipset Driver Installation

To install the chipset drivers, please follow the steps below:

Note:

If you are unsure how to arrive at Figure 6-6, see section 6.2 Driver DVD Auto-run before completing the steps below.

To install the Audio drivers, please follow the steps below:

Step 1: Choose "Chipset Drivers" from the menu as shown below.

Figure 6-6: Choose Chipset Drivers

Step 2: Choose "Windows" as shown in Figure 6-7.

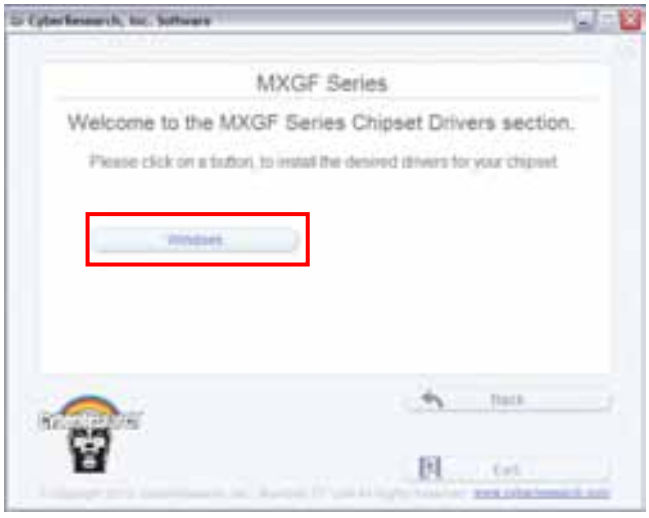
MXGF Series
Welcome to the MXGF Series Chipset Drivers section.
Please click on a button, to install the desired drivers for your chipset.
Windows
Back
Exit

Figure 6-7: Windows Chipset Driver

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Step 3: Follow the Intel Chipset Software Installation Utility prompts to complete the chipset driver installation.

6.5 SATA Driver Installation

Note:
If you are unsure how to arrive at Figure 6-8, see section 6.2 Driver DVD Auto-run before completing the steps below.

6.5.1 Intel Matrix Storage Manager (IMSM)

Step 1: Choose "SATA Drivers" from the menu as shown below.

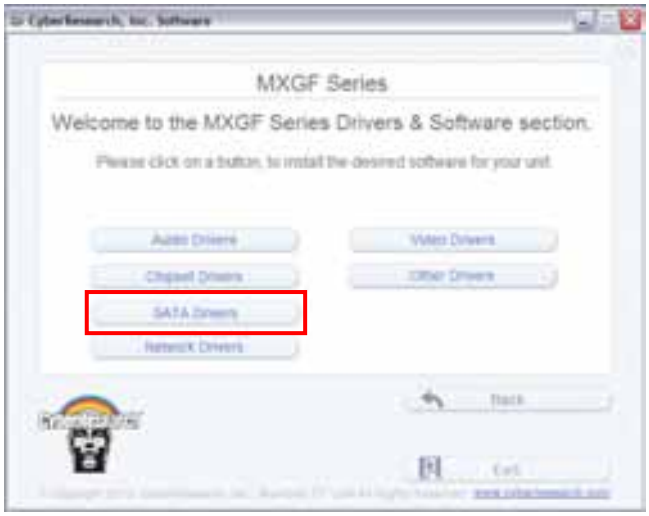

Figure 6-8: Choose SATA Drivers

Step 2: Choose "WINDOWS (IMSM)" from the selection in Figure 6-9.

Figure 6-9: Select WINDOWS (IMSM)

Step 3: To install the IMSM, follow the InstallShield Wizard prompts to complete installation.

6.5.2 SATA Advanced Host Controller Interface (AHCI)

Step 4: Choose “SATA Drivers” from the menu as shown below.

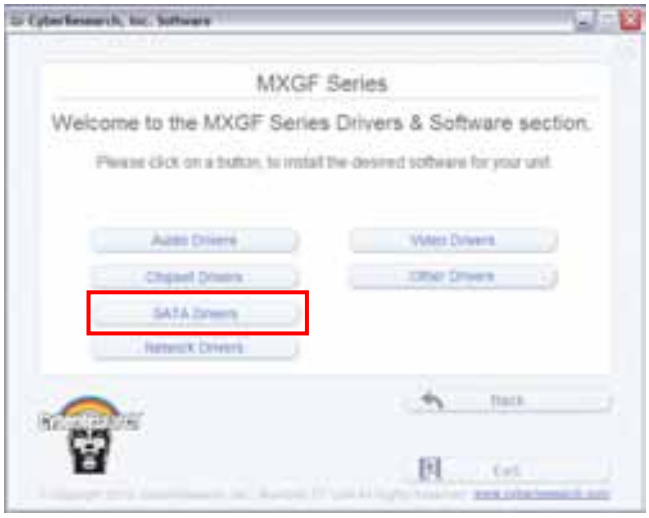

Figure 6-10: Choose SATA Drivers

Step 5: Choose “Windows (AHCI/SATA)” from the selection in Figure 6-11.

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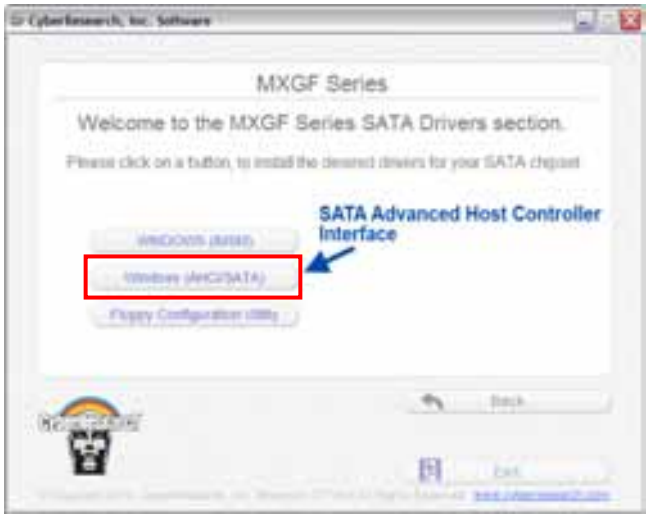

Figure 6-11: Select Windows XP/2K/Vista

Step 6: Follow the InstallShield Wizard prompts to complete installation**.**

6.5.3 Floppy Configuration Utility

Step 1: Choose “SATA Drivers” from the menu as shown below.

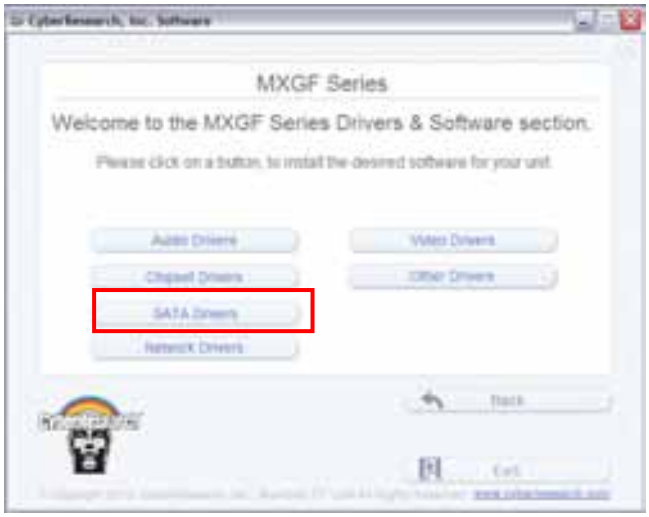

Figure 6-12: Choose SATA Drivers

Step 2: Choose “Floppy Configuration Utility” from the selection in Figure 6-13.

Figure 6-13: Select Floppy Configuration Utility

Step 3: Choose the folder in Figure 6-14 according to your operating system: **A)**"f6flp64" for 64-bit OS; **B)** "f6flpy32" for 32-bit OS**.**

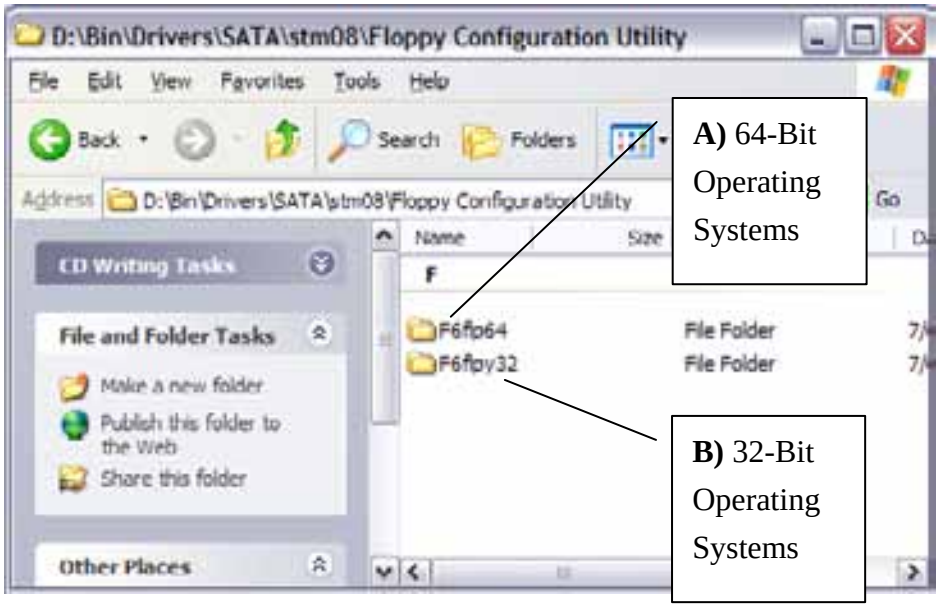

Figure 6-14: Select Folder According to OS Bit Size

Step 4: Open the "8.6.0.1007" folder, select and copy all files in Figure 6-15**.**

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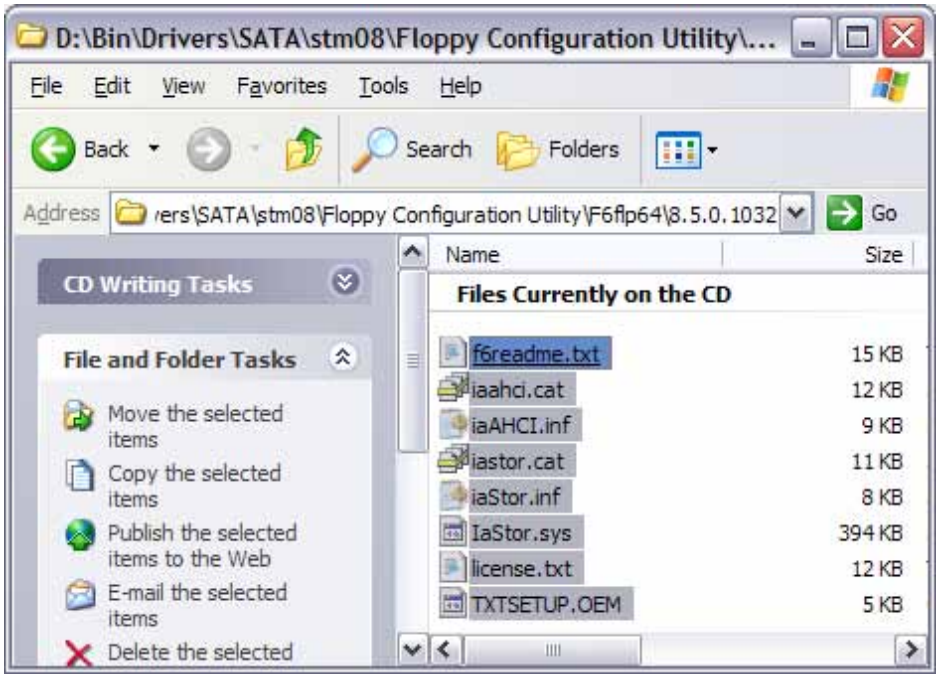

Figure 6-15: Copy Files

Step 5: Paste files onto FDD/HDD/CD/DVD.

Step 6: Navigate to System Properties.

Step 7: Locate the applicable SATA hardware device.

Step 8: Install driver by choosing the “Update Driver” function and pointing to the media where the files were copied.

6.6 Network Driver Installation

To install the network drivers, please follow the steps below:

Note:
If you are unsure how to arrive at Figure 6-6, see section 6.2 Driver DVD Auto-run before completing the steps below.

Step 1: Choose “Network Drivers” from the menu as shown below.

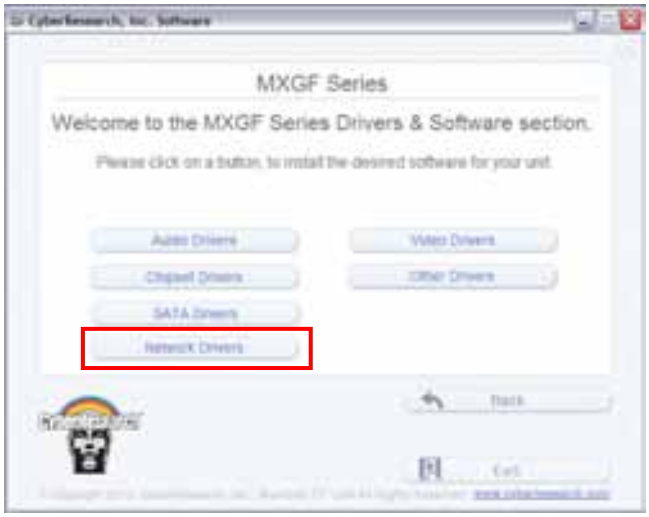

Figure 6-16: Choose Network Drivers

Step 2: Choose the appropriate operating system as shown in Figure 6-17.

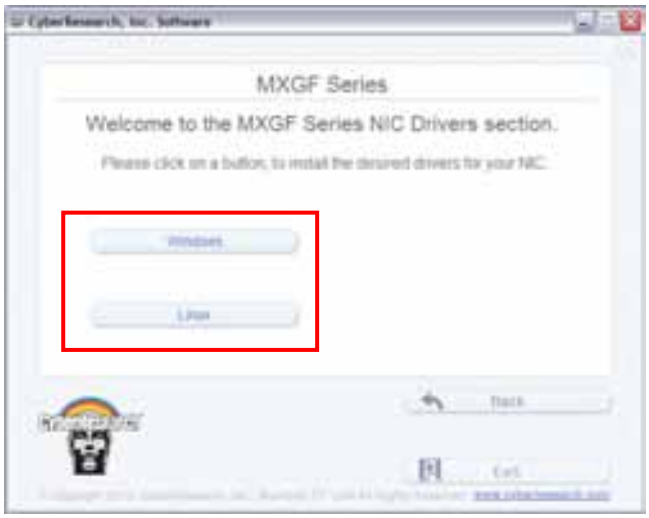

Figure 6-17: Select Operating System

Note:
We have included Linux drivers for those who wish to use them.

Step 3: Click "Windows" to begin installation of the Windows Network driver and follow the InstallShield Wizard prompts to complete the installation.

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6.7 Video Driver Installation

To install the video drivers, please follow the steps below:

Note:

If you are unsure how to arrive at Figure 6-18, see section 6.2 Driver DVD Auto-run before completing the steps below.

Step 1: Choose "Video Drivers" from the menu as shown below.

Figure 6-18: Choose Video Drivers

Step 2: Choose the appropriate operating system from the selection in Figure 6-19.

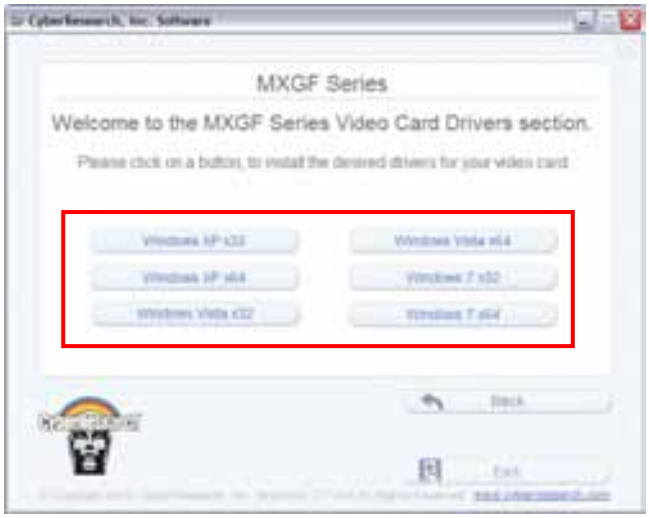

Figure 6-19: Select Operating System

Step 3: The Intel Chipset Graphics Driver Software InstallShield Wizard appears, as shown in Figure 6-20**.**

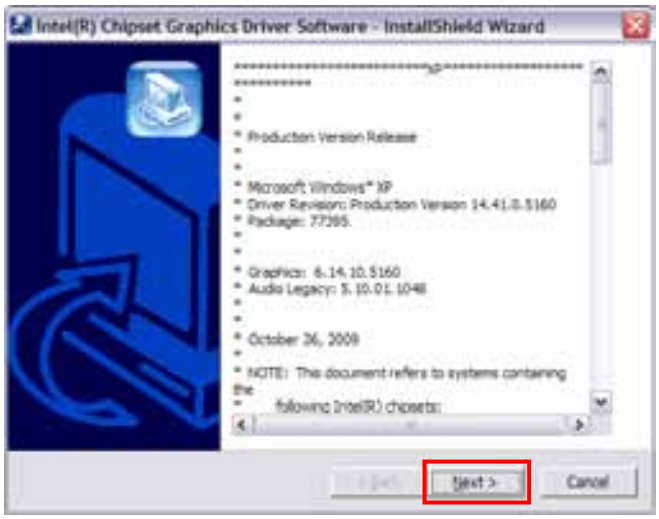

Figure 6-20: InstallShield Wizard

Step 4: Follow the InstallShield Wizard prompts to complete the installation.

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6.8 Other Drivers

6.8.1 LMS Drivers

The Intel® AMT Serial Over LAN (SOL) drivers allow remote management of the system through a serial port device redirected through the LAN interface. For more information on Intel® AMT, please visit http://www.intel.com/technology/platform-technology/intel-amt/. To set up SOL, please follow the steps below:

Note:
If you are unsure how to arrive at Figure 6-21, see section 6.2 Driver DVD Auto-run before completing the steps below.

Step 1: Choose "Other Drivers" from the menu as shown below.

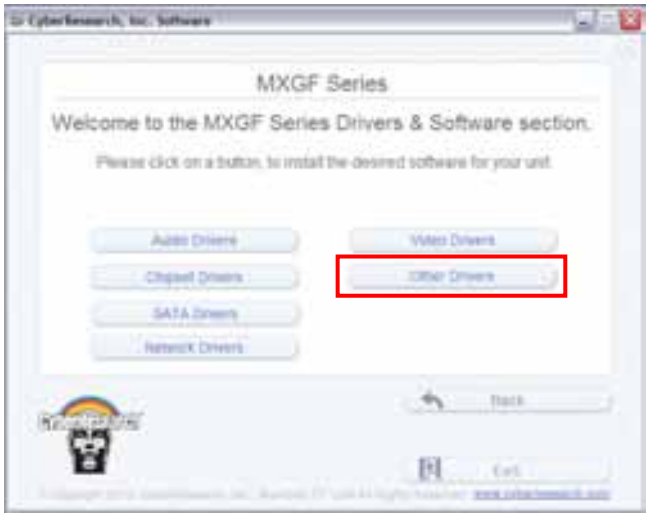

Figure 6-21: Choose Other Drivers

Step 2: Choose either of the LMS Drivers shown in Figure 6-22 depending upon system requirements. See the Intel Management and Security Status Application User's Guide on the installation DVD:

DVD Drive:\Bin\Drivers\Other\mxgf\LMS_SOL_IS\12.0.0.49974 for additional detail.

Note:

The folders of each LMS driver on the installation DVD are labeled with the respective LMS driver version number: DVD Drive:\Bin\Drivers\Other\mxgf – then choose LMS_SOL_IS or LMS_SOL.

Figure 6-22: Select LMS Driver

Step 3: Follow the InstallShield Wizard prompts to complete the installation.

6.8.2 Management Engine Interface

The Intel® AMT HECI drivers are a software interface between the operating system and the AMT subsystem. All communications between the OS and AMT is accomplished through the HECI interface. For more information on Intel® AMT, please visit http://www.intel.com/technology/platform-technology/intel-amt/. To install the Intel® AMT HECI drivers, please follow the steps below:

To install the Management Engine Interface drivers, please follow the steps below:

Note:
If you are unsure how to arrive at Figure 6-23, see section 6.2 Driver DVD Auto-run before completing the steps below.

Step 4: Choose “Other Drivers” from the menu as shown below.

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Figure 6-23: Choose Other Drivers

Step 5: Choose “Management Engine Interface” as shown in Figure 6-24.

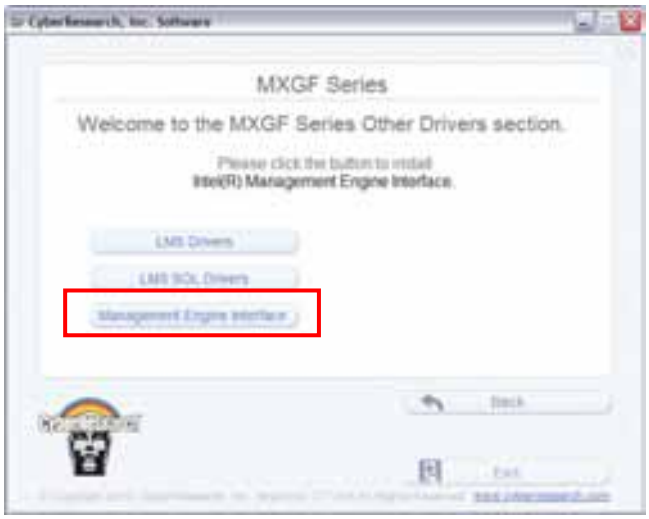

Figure 6-24: Select Management Engine Interface

Step 6: Follow the InstallShield Wizard prompts to complete the installation.

Chapter

7

Intel® AMT Setup

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7.1 Intel® AMT Setup Procedure

The MXGF is featured with the Intel® Active Management Technology (AMT) 3.0. To enable the Intel® AMT function, follow the steps below.

Step 1: Make sure the **DIMM1** socket is installed with one DDR2 DIMM.

Step 2: Connect an Ethernet cable to the RJ-45 connector labeled **LAN2_USB23**.

Step 3: The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled, including:

- Intel® AMT Configuration [Advanced]
- ME Subsystem Configuration [Advanced]
- Configure the Intel® Management Engine BIOS extension (MEBx) (see **Section 7.2** below)

Step 4: Properly install the Intel® AMT drives. Make sure to install both HECI and LMS_SOL drivers from the installation DVD.

Step 5: The following dialog window is displayed after the OS is loaded to show the Intel® AMT status on the MXGF is enabled.

Intel® Active Management Technology Status
Intel® Active Management Technology (Intel® AMT) status on this computer is: enabled.
To enable or disable Intel® AMT, contact your authorized system administrator.
For more information about Intel® AMT, click here.
OK

Figure 7-1: Intel® Active Management Technology Status Dialog

7.2 Intel® Management Engine BIOS Extension

This section describes the essential steps for using the Intel® Management Engine BIOS extension (MEBx).

Step 1: A screen prompts the user to press <Ctrl+P> after a single beep during boot-up process. To get into the Intel® MEBx settings, press <**Ctrl+P**>.

Step 2: Enter the Intel® current ME password as required (**Figure 7-2**). Enter the factory default ME password: **Abab12!@** (the Intel® default password is **admin**).

NOTE:

The default Intel® ME password is "admin". When the BIOS is cleared, the password will reset to "admin".

Figure 7-2: Intel® Current ME Password

Step 3: To change the password, select **Change Intel® ME Password**. Enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters). (**Figure 7-3**)

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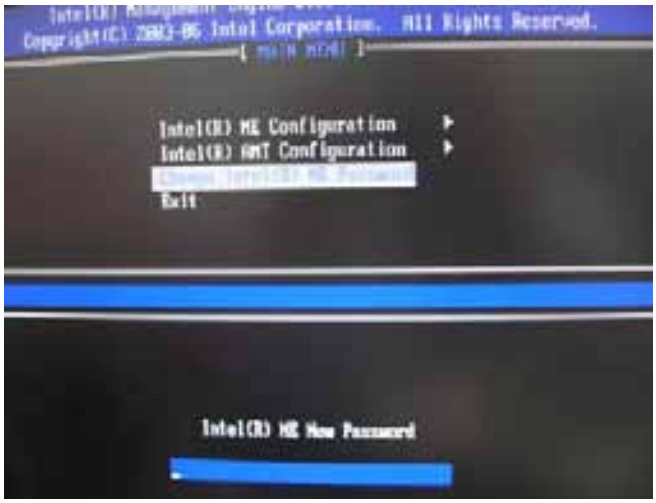

Figure 7-3: Change Intel® ME Password

Step 4: Verify the new password by entering again (**Figure 7-4**).

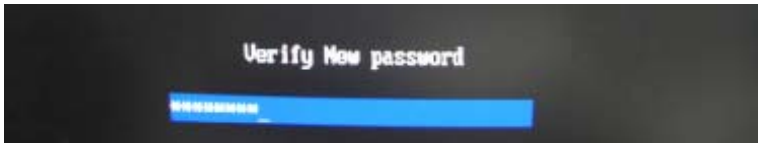

Figure 7-4: Verify New Password

Step 5: Select Intel® AMT Configuration and press Enter (**Figure 7-5**).

Figure 7-5: Intel® AMT Configuration

Step 6: Select Provision Model and press Enter. (**Figure 7-6**)

Figure 7-6: Provision Model

Step 7: When the screen in **Figure 7-7** prompts, enter N and press Enter.

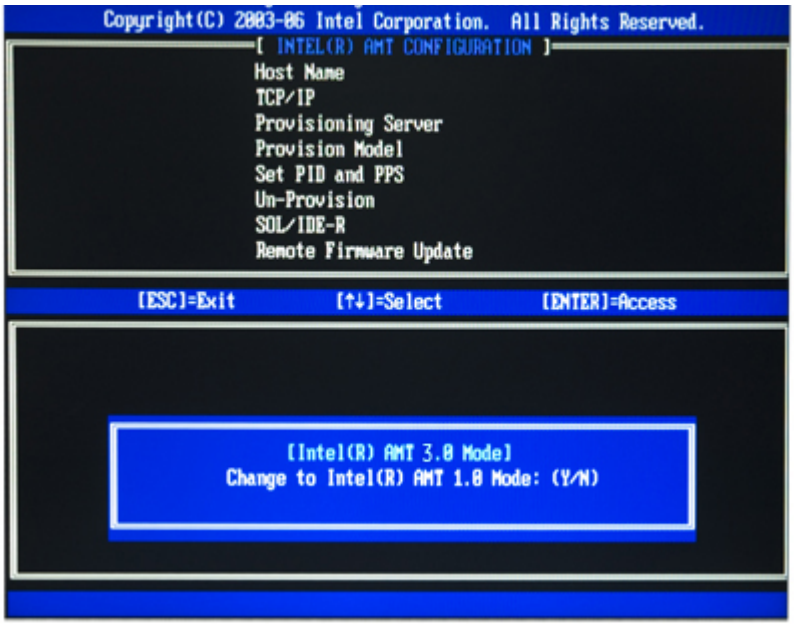

Figure 7-7: Intel® AMT 5.0 Mode

Step 8: A message prompts to confirm to Change to Small Business (**Figure 7-8**). Enter **Y** and press **Enter**.

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Figure 7-8: Enterprise

Step 9: Select TCP/IP (in Intel AMT Configuration) and press **Enter**. A message prompts for disabling network interface. Enter **N** to enable network interface.

Figure 7-9: Enable Network Interface

Step 10: Enable or disable DHCP. DHCP is enabled by default. If DHCP is disabled, enter the following TCP/IP settings:

- Static TCP/IP address (the static TCP/IP address and Intel® AMI Host Name must be different from those configured in the operating system)
- Subnet mask
- Default Gateway address (optional)
- Preferred Domain Naming Services (DNS) serer address (optional)
- Alternate DNS server address (optional)
- Domain name (optional)

Step 11: Make other necessary settings in the Intel® MEBx depending on users' need.

Step 12: To exit the Intel® MEBx, return to the main menu and select **Exit**. (**Figure 7-10**)

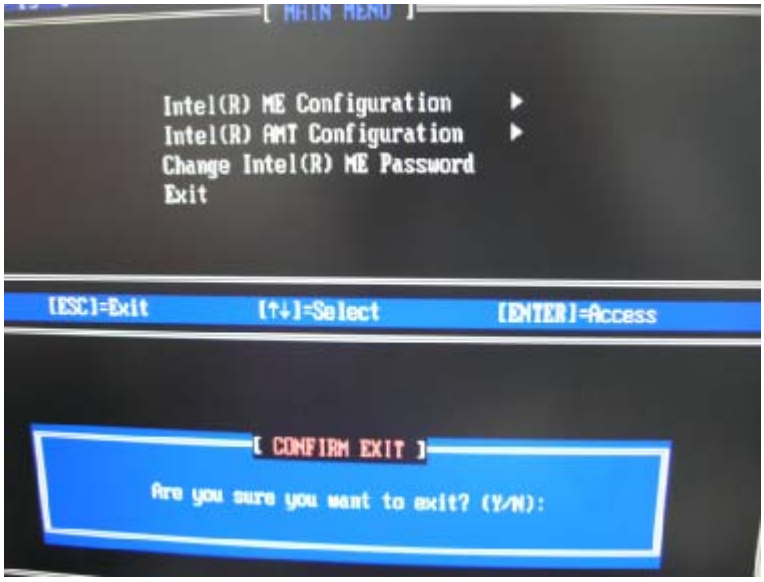

Figure 7-10: Exit

7.3 Using the Intel® AMT Web Interface

NOTE:

Prior to use the Intel® AMT web interface, please make sure the Intel® AMT drivers are properly installed in the MXGF and the Intel® AMT enabled confirmation dialog window displays after boot-up.

To access an Intel® AMT client system from a remote console, follow the steps below.

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Step 1: Obtain the IP address of the client system.

Step 2: On the remote management console, open a web browser.

Step 3: If DHCP is enabled in the TCP/IP menu of the Intel® ME BIOS (**Section 7.2**, **Step 10**), get the client system IP address in the MS DOS. Enter the client system IP address and the port number in the web browser:

http://*ip_address*:16992 Example: http://192.168.1.7:16992 (**Figure 7-11**)

Or simply enter the defined host name: http://*host_name*:16992

Example: http://AMTsystem:16992

Figure 7-11: Intel® AMT Web Address

Step 4: If a static IP address is defined for the Intel® AMT client system, enter the defined client system IP address and the port number in the web browser.

Step 5: A login window prompts (**Figure 7-12**).

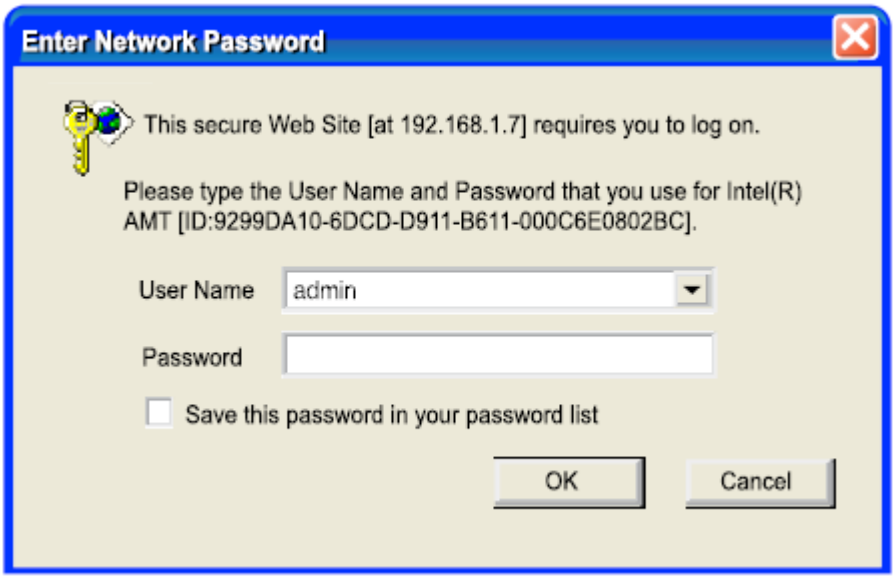
Enter Network Password
This secure Web Site [at 192.168.1.7] requires you to log on.
Please type the User Name and Password that you use for Intel(R) AMT [ID:9299DA10-6DCD-D911-B611-000C6E0802BC].
User Name
admin
Password
Save this password in your password list
OK
Cancel

Figure 7-12: Intel® AMT Web Login Dialog

Step 6: Enter admin as the user name (**Figure 7-12**).

Step 7: Enter the password changed in the Intel® MEBx configuration. The default password is **Abab12!@**

Step 8: Press **OK** and the Intel® AMT web interface appears (**Figure 7-13**).

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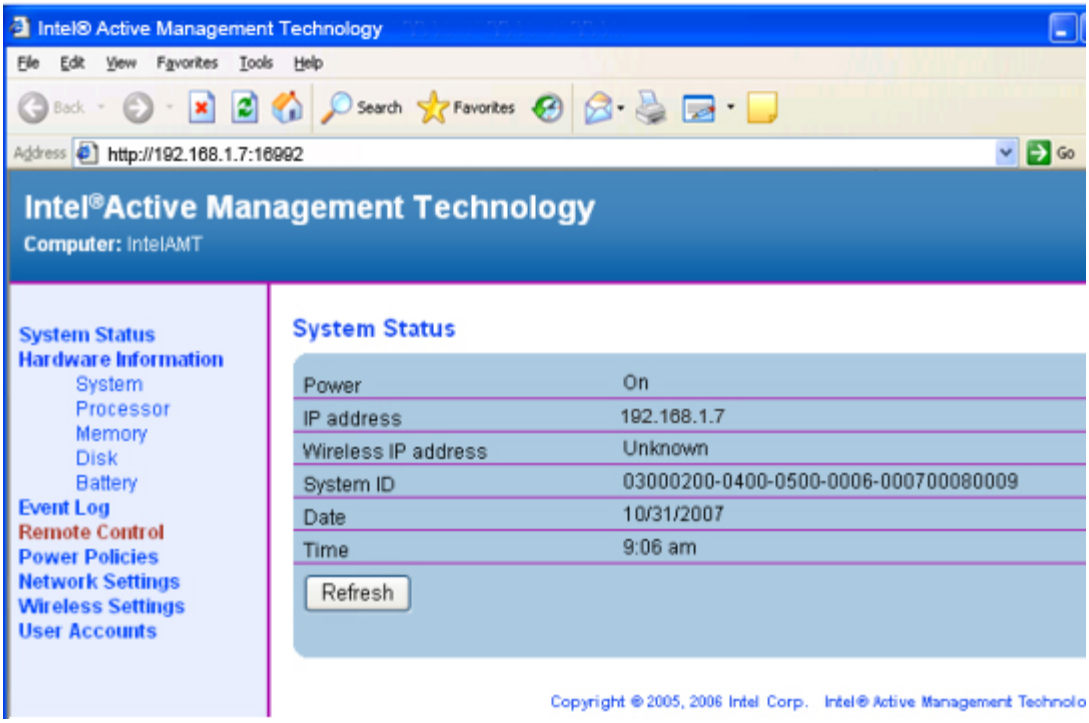

Figure 7-13: Intel® AMT Web Interface

Appendix

A

BIOS Options

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Below is a list of BIOS configuration options in the BIOS chapter.

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Appendix

B

Terminology

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AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Control Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

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LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Digital I/O Interface

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C.1 Introduction

The DIO connector on the MXGF is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

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Appendix

D

Watchdog Timer

NOTE:

The following discussion applies to the DOS environment. Contact CyberResearch, Inc. support for Windows drivers.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer.

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table D-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

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NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```

Appendix

E

Compatibility

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NOTE:

The compatible items described here have been tested by the manufacturer and found to be compatible with the MXGF.

E.1 Compatible Operating Systems

The following operating systems have been successfully run on the MXGF.

- Microsoft Windows Vista
- Microsoft Windows XP (32-bit)
- Microsoft Windows 2000

E.2 Compatible Processors

The following Intel® Socket LGA775 processors have been successfully tested on the MXGF

CPU	FSB	Frequency	
Intel® Core 2 Duo E2140	800 MHz	1.6 GHz	65 nm
Intel® Core 2 Duo E2180	800 MHz	2 GHz	65 nm
Intel® Core 2 Duo E6700	1066 MHz	2.13 GHz	65 nm
Intel® Core 2 Duo E8500(ES)	1333 MHz	3.16 GHz	45 nm
Intel® Core 2 Quad Q9300(ES)	1333 MHz	2.5 GHz	45 nm

Table E-1: Compatible Processors

E.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the MXGF other memory modules that comply with the specifications may also work on the MXGF but have not been tested.

The following memory modules have been successfully tested on the MXGF.

Manufacturer	Model	Capacity	Speed	Type
ADATA	512 MB DDRII 667MHz	512 MB	667 MHz	DDR2
Apacer	512 MB DDRII 667MHz	512 MB	667 MHz	DDR2
DSL	512 MB DDRII 800MHz	512 MB	800 MHz	DDR2
Kingbox	512 MB DDRII 800MHz	512 MB	800 MHz	DDR2
Kingston	1 GB DDRII 800MHz	1 GB	800 MHz	DDR2
Kingston	512 MB DDRII 800MHz	512 MB	800 MHz	DDR2
NEXS	1 GB DDRII 800MHz	1 GB	800 MHz	DDR2
Transcend	512 MB DDRII 800MHz	512 MB	800 MHz	DDR2
Transcend	1 GB DDRII 800MHz	1 GB	800 MHz	DDR2
Transcend	512 MB DDRII 667MHz	512 MB	667 MHz	DDR2
UMAX	512 MB DDRII 800MHz	512 MB	800 MHz	DDR2
UNIGEN	512 MB DDRII 667MHz	512 MB	667 MHz	DDR2

Table E-2: Compatible Memory Modules

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Product Service

Diagnosis and Debug

CyberResearch, Inc. maintains technical support lines staffed by experienced Applications Engineers and Technicians. There is no charge to call and we will return your call promptly if it is received while our lines are busy. Most problems encountered with data acquisition products can be solved over the phone. Signal connections and programming are the two most common sources of difficulty. CyberResearch support personnel can help you solve these problems, especially if you are prepared for the call.

To ensure your call's overall success and expediency:

1) Have the phone close to the PC so you can conveniently and quickly take action that the Applications Engineer might suggest.
2) Be prepared to open your PC, remove boards, report back-switch or jumper settings, and possibly change settings before reinstalling the modules.
3) Have a volt meter handy to take measurements of the signals you are trying to measure as well as the signals on the board, module, or power supply.
4) Isolate problem areas that are not working as you expected.
5) Have the source code to the program you are having trouble with available so that preceding and prerequisite modes can be referenced and discussed.
6) Have the manual at hand. Also have the product's utility disks and any other relevant disks nearby so programs and version numbers can be checked.

Preparation will facilitate the diagnosis procedure, save you time, and avoid repeated calls. Here are a few preliminary actions you can take before you call which may solve some of the more common problems:

1) Check the PC-bus power and any power supply signals.
2) Check the voltage level of the signal between SIGNAL HIGH and SIGNAL LOW, or SIGNAL+ and SIGNAL– . It CANNOT exceed the full scale range of the board.
3) Check the other boards in your PC or modules on the network for address and interrupt conflicts.
4) Refer to the example programs as a baseline for comparing code.

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Warranty Notice

CyberResearch, Inc. warrants that this equipment as furnished will be free from defects in material and workmanship for a period of one year from the confirmed date of purchase by the original buyer and that upon written notice of any such defect, CyberResearch, Inc. will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way which may, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding or inconsistent with its specifications or if the serial number has been removed.

CyberResearch, Inc. does not assume any liability for consequential damages as a result from our products uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage prepaid. Package it securely and insure it. You will be charged for parts and labor if the warranty period has expired.

Returns and RMAs

If a CyberResearch product has been diagnosed as being non-functional, is visibly damaged, or must be returned for any other reason, please call for an assigned RMA number. The RMA number is a key piece of information that lets us track and process returned merchandise with the fastest possible turnaround time.

PLEASE CALL FOR AN RMA NUMBER!

Packages returned without an RMA number will be refused!

In most cases, a returned package will be refused at the receiving dock if its contents are not known. The RMA number allows us to reference the history of returned products and determine if they are meeting your application's requirements. When you call customer service for your RMA number, you will be asked to provide information about the product you are returning, your address, and a contact person at your organization.

Please make sure that the RMA number is prominently displayed on the outside of the box.

• Thank You •

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